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1976

Procedures for Determining the Impact on Air Quality of Proposed New Emission Sources

August 15, 1975

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Prepared for
Permit Section
Compliance Branch

by
Air Resource Analysis Section
Air Quality Branch
Division of Air Pollution Control

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Procedures for Determining the Impact on Air Quality of Proposed New Emission Sources

I. Purpose

This document provides a procedure for analyzing the impact on the ambient air quality of proposed new particulate and sulfur oxide emission sources. Its use will aid in determining whether a proposed emission source will cause a violation of either the short-term or the annual national ambient air quality standards.

II. Overview of Procedures

The State's Implementation Plan incorporated a set of regulations and emission standards which were designed to attain and maintain the air quality at or better than the national ambient air quality standards (NAAQS). Studies made of the impact of industrial growth on the ambient air quality (AAQ) of the three "worst regions" in the State, the Chicago, Peoria, and the St. Louis major metropolitan areas (MMA's) provided a means for predicting the 1980 AAQ for particulates and sulfur oxides in each of these MMA's. The assumption was made that all existing sources would be in compliance with our emission regulations by 1980. Any new emission source will affect the AAQ and could possibly cause a violation of the NAAQS.

The procedures outlined in this report utilize the following elements in determining whether the NAAQS for particulates or SO_2 will be violated if a new source is constructed and operated.

1. The predicted 1980 AAQ due to existing facilities.
2. The additional pollutant concentration from the proposed new source.
3. The additional pollutant concentration caused by the difference between the actual and allowable emissions of an existing source(s) not expected to be in compliance when the new source becomes operational where such existing source(s) is owned by the construction permit applicant.

A Climatological Dispersion Model (CDM) is used to determine the resultant pollutant concentration from elements 2 and 3 which is then superimposed upon the projected 1980 AAQ concentrations. The final result is the anticipated annual AAQ due to the additional emissions from the proposed new source. The short-term (24-hour) annual maximum ambient air quality is calculated using a mathematical model described by Larsen.[1] If the increase in pollutant concentration does not violate the annual or the short-term NAAQS (or any emission regulation or standard), it is likely that the new source construction permit will be approved.

[1]Larsen, R. I. A Mathematical Model for Relating Air Quality Measurements to Air Quality Standards. U.S. EPA, Office of Air Programs Publication No. AP-89. November, 1971.

The procedures described above apply to all cases except for the calculated short-term maximum concentration for sites located outside of any MMA (non-MMA's). In this situation, the data required for Larsen's model is generally not available, however, two alternate methods are available for the analysis. The simplest is by use of a simplified "worst case" dispersion model. If this method proves to be indeterminate, then the proposed source should be modeled for its affect on the AAQ.

III. Application of Procedures

Use of the permit analysis procedures is generally self-explanatory. Figure 1 is a flow chart of the procedures used. Figure 2, worksheet, lists each of the steps to be performed, indicates the methods to be used and provides a record of the analysis.

The worksheet contains blank spaces (_____) which require a numerical answer and various underlined responses (XXXXX) requiring the correct answer to be circled. The worksheet consists of a number of steps to follow and a short description of each step is shown below:

Step	Description

1. Data regarding the location of the proposed new source.

2. Determine the MMA in which the source will be sited.

3. A listing of sources which will not be in compliance with particulate or SO_2 emission regulations which are owned by the owner of the new source. The excess emissions from these sources will be considered as a separate existing source which will increase the 1980 predicted AAQ around those sources.

4. A judgment decision which implies that sources from step 3 will or will not cause a pollutant concentration increase at or near the proposed new source. If in doubt, it would be advisable to discuss such with the Air Resource Analysis Section (ARAS), or to include the source(s) in the modeling of the proposed source.

5 and 6. The determination of the maximum annual pollutant concentration using (1) the projected 1980 concentration and (2) the increase in pollutant concentration from the proposed new source plus any addition concentration caused by sources not in compliance which affect the AAQ in the vicinity of the proposed source.

The analyst superimposes the increase in pollutant concentrations from the new source(s) as calculated by the CDM upon the projected 1980 AAQ concentrations. The sum of their values is the anticipated AAQ. Since the projected 1980 and calculated pollutant concentrations both vary spacially, it is important to determine the geographical position where the summed concentrations are the greatest. This is the value which should be reported in steps 5 and 6.

7 and 8. This step consolidates data from the maps and tables used in the analysis to solve the equations in steps 9, 10, and 11.

9. MMA maps show projected 1980 particulate concentration in arithmetic mean values so as to be compatible with the arithmetic values obtained from the CDM. The final arithmetic value is converted to geometric mean values for comparison with the annual standard which is also a geometric mean.

Steps 1 through 9 determine the projected maximum annual ambient air quality in the vicinity of the proposed new source.

10 and 11. The maximum short-term (24-hour) concentration caused by the proposed new source is determined using the technique described by Larsen. (For sources <u>in</u> a MMA only.)

12 and 13. For <u>non-MMA</u> sources, the maximum short-term concentration must be determined from modeling because the data required by Larsen's technique is not available. However, if the source does not violate the emission limit provided by the dispersion rule, it can generally be assumed that the short-term standard will not be violated. If this method shows a violation, contact the Air Resource Analysis Section for further analysis by more sophisticated modeling techniques.

14 and 15. These steps consolidate the previously obtained data into grant or deny statements.

16. Shows the initial analysis result as grant or deny.

17. Allows for other factors to affect the initial grant or deny decision.

18. Final grant or deny decision to be placed in upper right hand corner of the worksheet for easy reference.

19. A listing of sources owned by the new source applicant which will not be in compliance with particulate or SO_2 regulations by 1980.

Figure 1

FACILITY AIR QUALITY ANALYSIS

Fill out worksheet (Figure 2)

Does the owner of this source have any other installations in the state which *will not* be in compliance with particulate or SO2 regulations by 1980?

NO — YES

1. List each such source.

Determine in which MMA the proposed new source is to be located.

CHICAGO MMA

Geocode	County
031	Cook
043	DuPage
063	Grundy
089	Kane
091	Kankakee
	Kendall
097	Lake
111	McHenry
197	Will

NO

PEORIA MMA

Geocode	County
143	Peoria
179	Tazewell

NO

ST. LOUIS MMA

Geocode	County
119	Madison
163	St. Clair

NO

OTHER MMA'S

Geocode	County
019	Champaign
113	McClean
115	Macon
161	Rock Island
167	Sangamon
201	Winnebago

NON MMA'S

All other geocode and counties

YES — YES — YES — YES — YES

Run the Climatological Dispersion Model (CDM) to determine the maximum projected increase in Particulate and/or SO2 (in ug/m^3) caused by: a) the new source b) the new source and attendant facility

Add CDM results to the Ambient Air Quality which is determined from appropriate charts

For Chicago MMA: use figures 3 through 6 with table 2

For Peoria MMA: use figures 7 and 8 with table 2

For St. Louis MMA: use figures 9 and 10 with table 2

Add CDM results to the following given data

For 'Other MMA's':
Particulates 60 ug/m^3
SO_2 40 ug/m^3

For 'Non MMA's':
Particulates of [illegible]
SO2 of [illegible]

Compare the Projected Annual Pollutant Concentrations with the Annual Ambient Air Standard

Calculate the Projected Maximum Short Term Ambient Air Quality and compare with the Short Term Standard

Use emission limit formula. (Appendix V) Calculate and compare actual emissions with the allowable emissions

Recommend *GRANT* or *DENIAL* of application

Is a more detailed analysis required?
YES (Further analysis) NO

GRANT OR DENY

Date_____

Engineer_____

Figure 2

Work Sheet

Final Decision

Grant Deny

Step Facility

1. Name:_____

   Location:_____
   address city county

   Owner:_____

   UTM: X=_____ Y=_____ Geocode_____

2. Proposed Source MMA: Chicago Peoria St. Louis Other Non MMA

3. Does applicant have other sources in the State which will not be in compliance with particulate or SO_2 regulations by 1980? If yes - how many? _____ Complete step 19 for each such source. NO / YES

4. In your judgement, will any of the step 3 sources affect the AAQ near the proposed new source? If yes - show the source numbers: ____, ____, ____. NO / YES

Projected Maximum Annual Concentrations
(CDM plus existing air quality)

5. The projected maximum Particulate annual ambient air quality with the proposed source operating is _____ ug/m^3. (arithmetic mean)

6. The projected maximum SO_2 annual ambient air quality with the proposed source operating is _____ ug/m^3. (arithmetic mean)

MAXIMUM SHORT TERM CONCENTRATION
ALL MMA'S (steps 7 through 11)

7. The nearest particulate monitor to the maximum concentration in step 5 is number (a)____ which has a SGD of (b)_____ and the R value is (c)_____.

8. The nearest SO_2 monitor to the maximum concentration in step 6 is number (a)_____ which has a SGD of (b)_____ and the R value is (c)_____.

9. The particulate geometric mean (M_g) concentration is_____ ug/m^3.

   $Mg = M / \exp [.5 \ln^2 SGD]$

   M = value of step 5; SGD = value of step 7b.

10. 24 hour maximum concentration (particulates) (R)(M) _____ ug/m^3
(R from 7C; M from 5)

11. 24 hour maximum concentration (SO_2) = (R)(M) = _____ ug/m^3.
(R from 8C; M from 6)

NON MMA'S (steps 12 through 13)

12. Using the emission limit formula the actual particulate emissions were GREATER LESS than the allowable emissions.

13. Using the emission limit formula the actual SO_2 emissions were GREATER LESS than the allowable emissions.

CONCLUSIONS FROM THE PERMIT ANALYSIS

14a.	The answer to Step 9 was than 75 ug/m^3.	GREATER Deny	LESS Grant	
14b.	The answer to Step 6 was than 80 ug/m^3.	GREATER Deny	LESS Grant	
14c.	The answer to Step 10 was than 260 ug/m^3.	GREATER Deny	LESS Grant	NON MMA Not Applicable
14d.	The answer to Step 11 was than 365 ug/m^3.	GREATER Deny	LESS Grant	NON MMA Not Applicable
15a.	The answer to Step 12 was	GREATER Deny	LESS Grant	IN A MMA Not Applicable
15b.	The answer to Step 13 was	GREATER Deny	LESS Grant	IN A MMA Not Applicable

If any answer to Steps 14 contain a "deny" the application should be denied for projected violation of the NAAQS.

If any answer to Steps 15 contain a "deny", contact the Air Resources Section for possible modeling of the source for short term violations.

16. The permit application should be GRANTED DENIED

17. Should this decision be reconsidered for any reason? _____ If yes, why? _____

_____

_____

_____

18. The final decision is to Grant Deny the application.
(also show answer in upper right portion of Page 1)

19. Facilities owned by the applicant not expected to be in compliance with particulate or SO_2 regulations by 1980.

1. Facility Name: _____

   Location: _____

   UTM: X = _____ Y = _____ Geocode = _____

2. Facility Name: _____

   Location: _____

   UTM: X = _____ Y = _____ Geocode = _____

3. Facility Name: _____

   Location: _____

   UTM: X = _____ Y = _____ Geocode = _____

Notes/Comments on Analysis

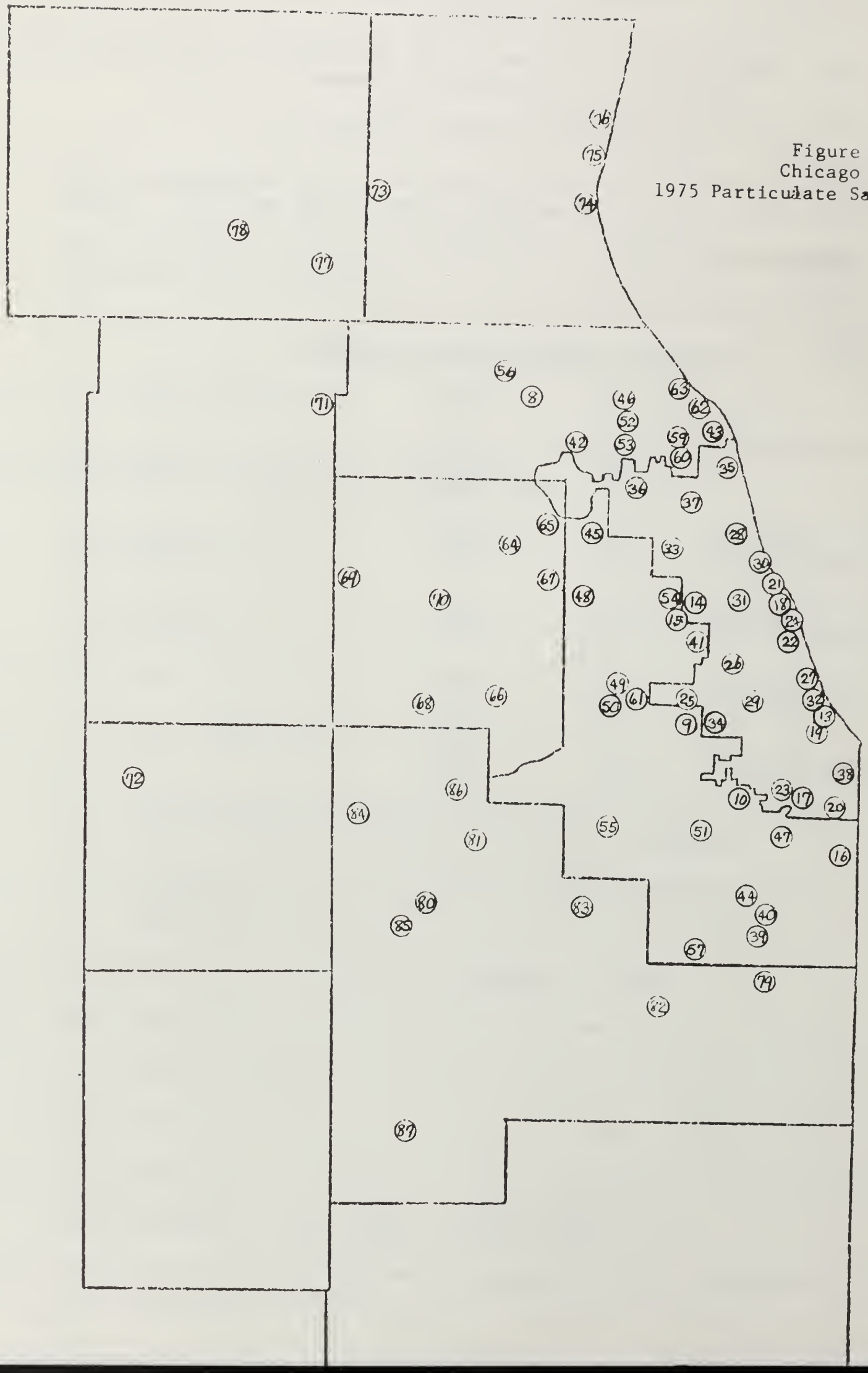


Figure 3
Chicago MMA
1975 Particulate Sampling Sites

Figure 4
Chicago MMA
Particulate Ambient Air Quality
(arithmetic mean ug/m^3)

400000E 440000E 470000E

4670000N

41	41	41	42	42	43	43	43	44	43	43	43	43	4
42	41	42	42	43	44	44	44	45	44	44	44	43	4
42	42	42	43	44	46	46	46	46	46	45	44	43	4
42	42	42	43	46	52	47	50	50	48	46	45	45	4
42	42	43	44	47	50	50	56	57	50	48	47	46	4
42	42	43	44	46	48	53	64	67	53	50	48	47	4
42	42	43	44	46	49	59	64	61	55	53	51	49	4
42	42	43	44	46	52	57	57	57	60	59	56	52	4

4520000N

42	42	43	45	46	47	48	50	55	69	70	66	56
42	43	44	47	46	46	47	50	58	72	94	85	64
42	43	44	46	45	45	46	48	52	59	73	77	74
42	43	46	44	44	44	45	47	51	53	55	57	56
42	44	44	43	43	44	44	46	50	48	48	49	49
42	46	43	43	43	43	44	44	45	45	45	45	
42	43	42	42	42	42	43	43	43	43	43	43	

4580000N

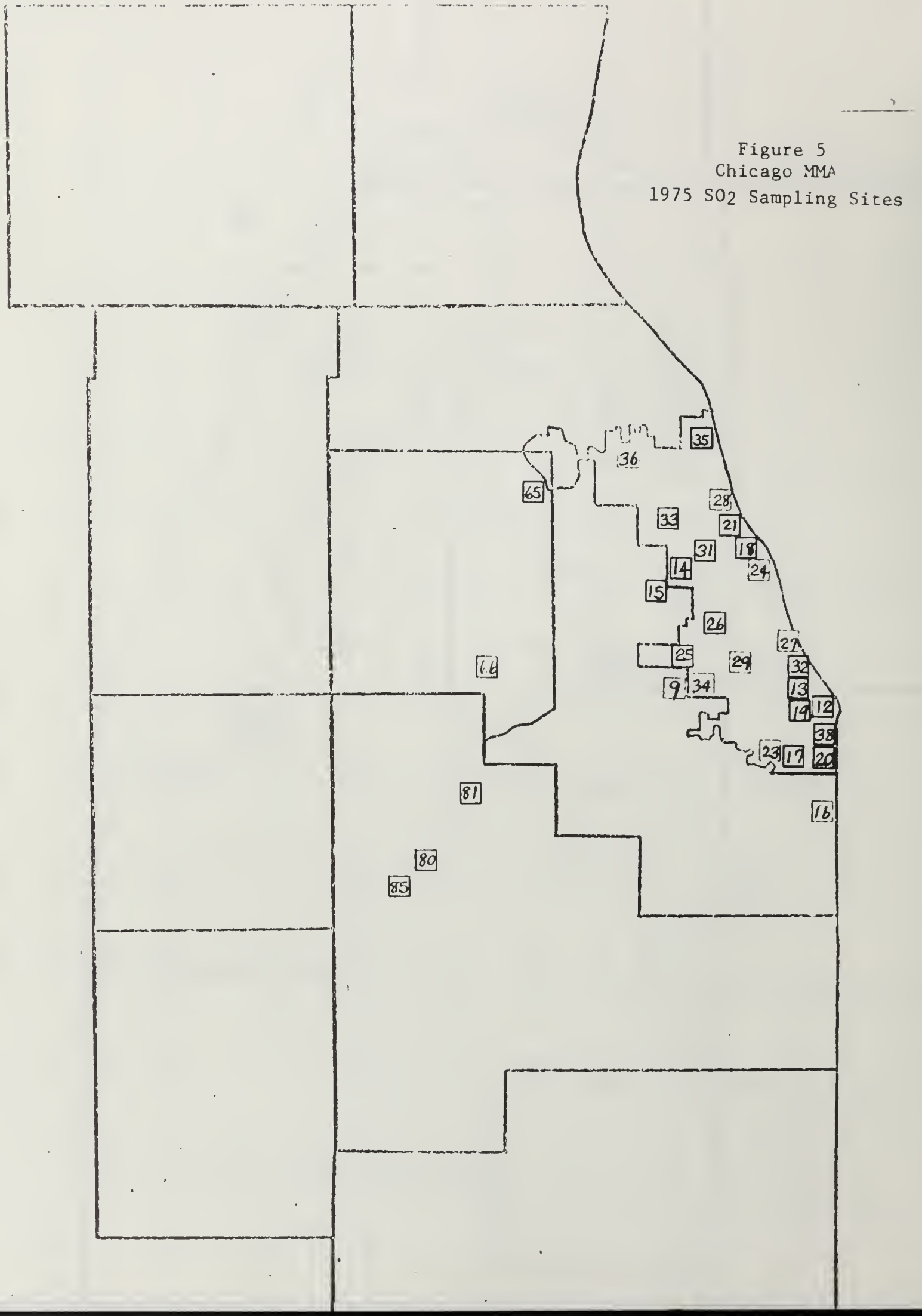


Figure 5
Chicago MMA
1975 SO_2 Sampling Sites

Figure 6
Chicago MMA
SO_2 Ambient Air Quality
(arithmetic mean, ug/m^3)

400000E 440000E 470000E

4670000N

3 4 5 6 8 9 10 12 12 12 11 9 8 7
4 5 6 7 9 11 13 15 16 15 13 11 10 8
5 5 7 9 12 15 17 21 21 19 16 14 12 1
6 6 8 10 16 19 23 34 33 25 20 17 14 1
5 7 9 12 19 22 34 54 54 34 25 20 17 1
6 8 10 14 22 25 39 60 64 43 31 26 21 1
6 8 11 14 21 28 42 56 62 48 39 34 27 2

4620000N

7 9 12 16 22 34 43 48 59 57 53 48 35 2
7 9 13 19 23 24 29 40 47 58 66 64 45 2
7 10 15 28 22 22 28 49 58 60 91 87 56 3
8 12 17 23 19 19 24 31 41 53 64 69 60 3
8 14 21 18 17 17 20 26 31 35 36 37 38 2
11 20 23 16 14 15 17 25 25 23 14 21 22 2
11 55 18 13 12 12 14 15 16 15 14 21

4580000N 13 22 17 11 10 10 10 11 11 10 10 9

Figure 7
Peoria MMA
Particulate Ambient Air Quality
(arithmetic mean ug/m^3)

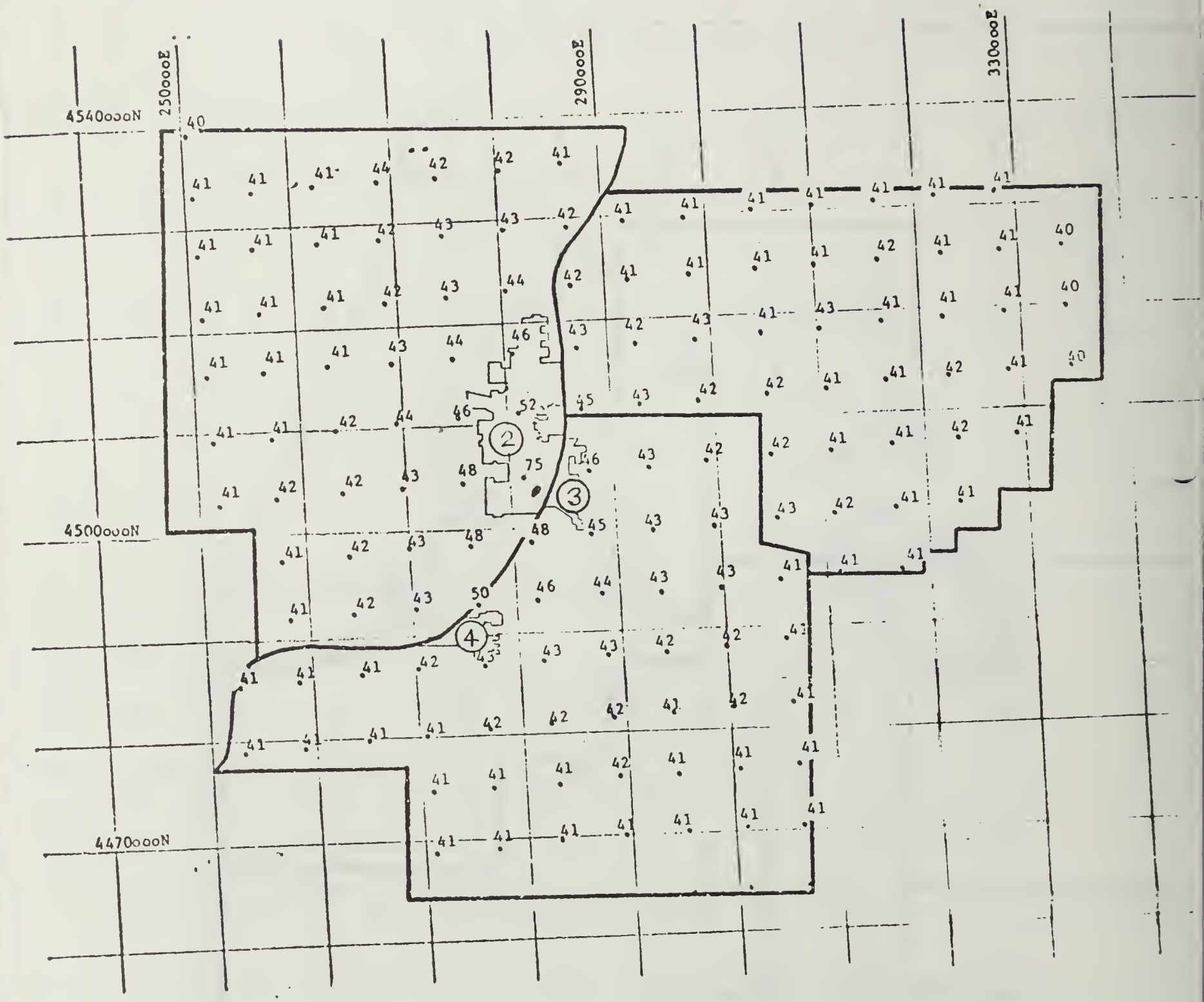


Figure 8
Peoria MSA
SO_2 Ambient Air Quality
(arithmetic mean, ug/m^3)

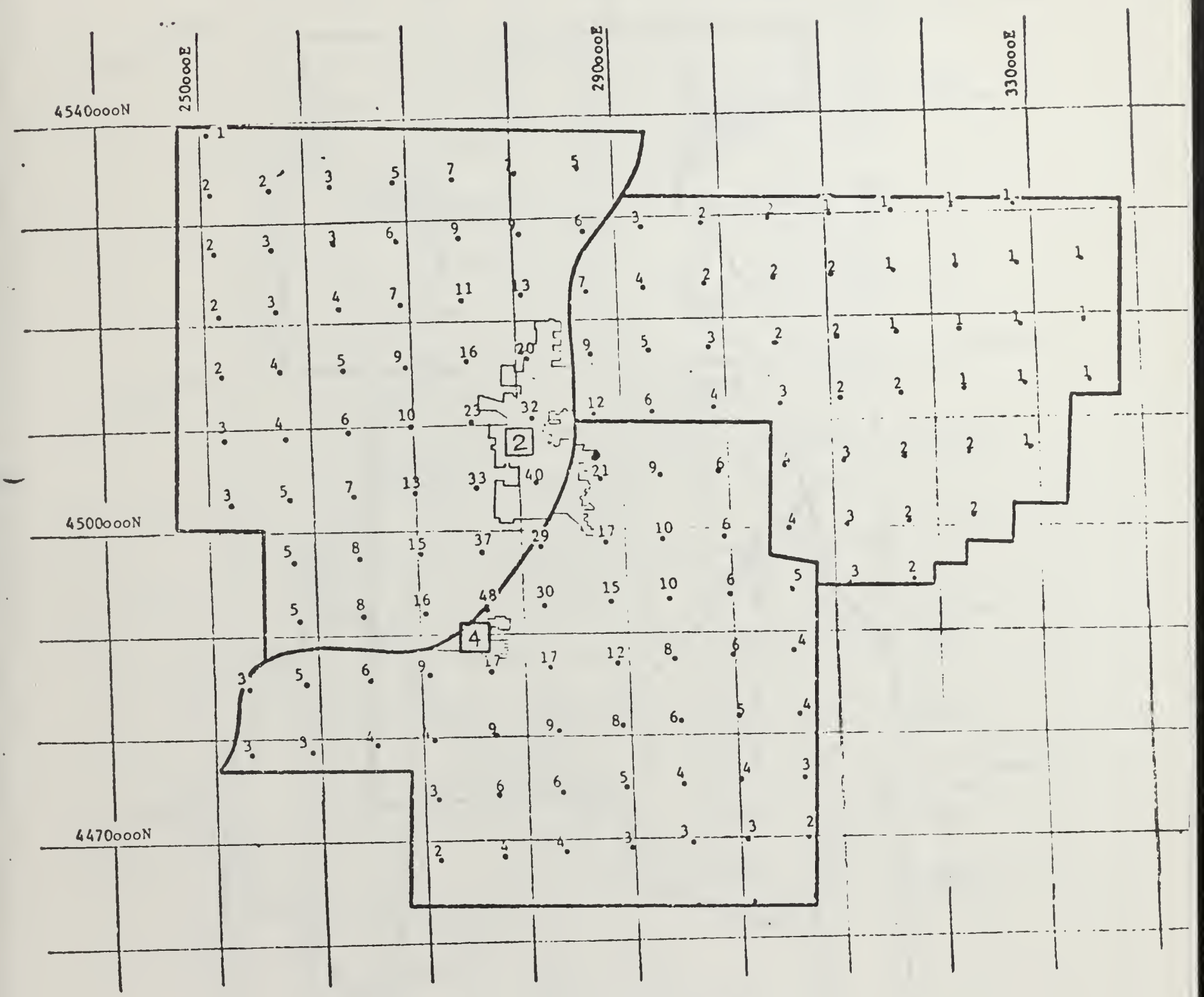


Figure 9
St. Louis MMA
Particulate Ambient Air Quality
(arithmetic mean ug/m³)

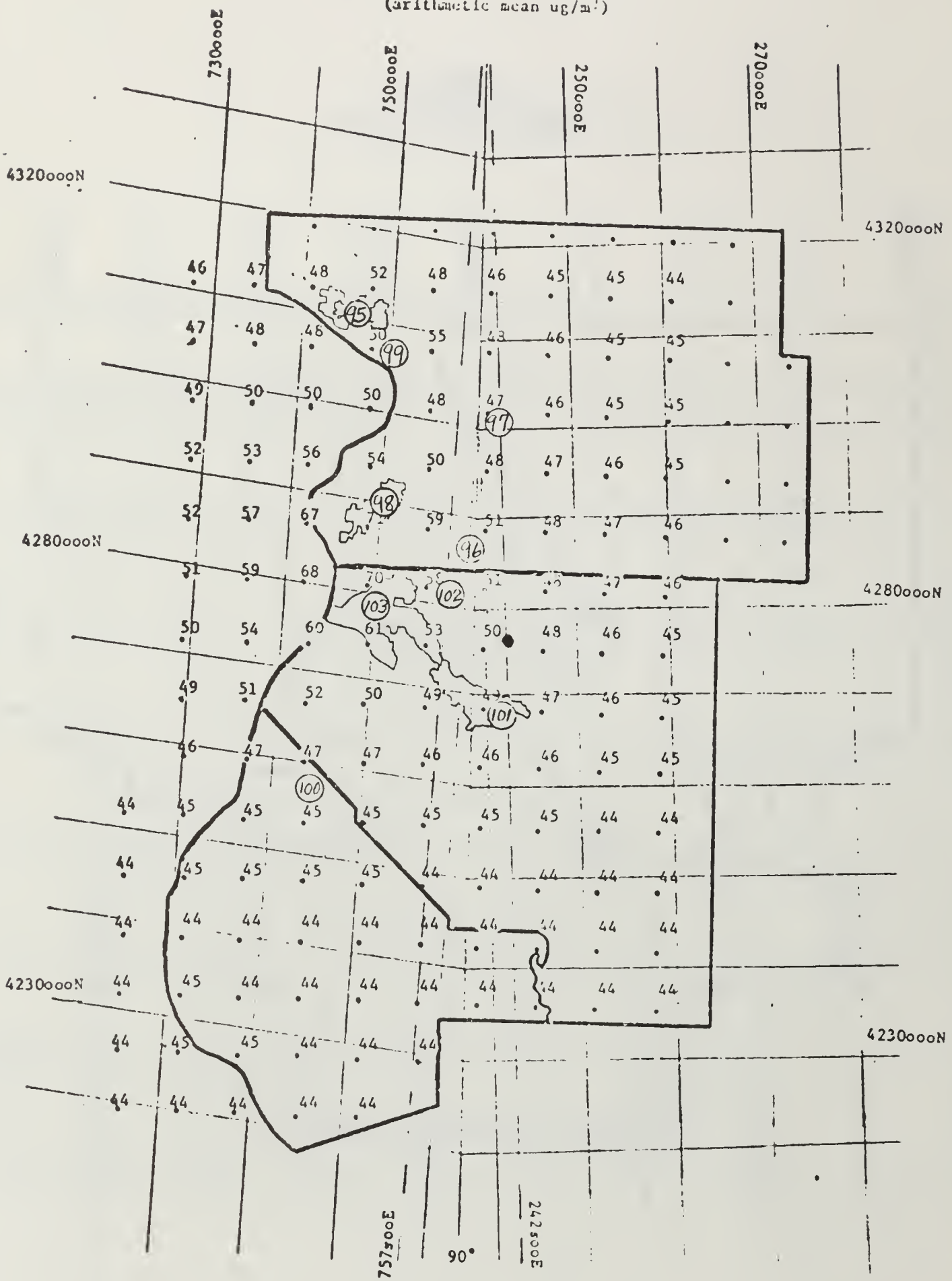
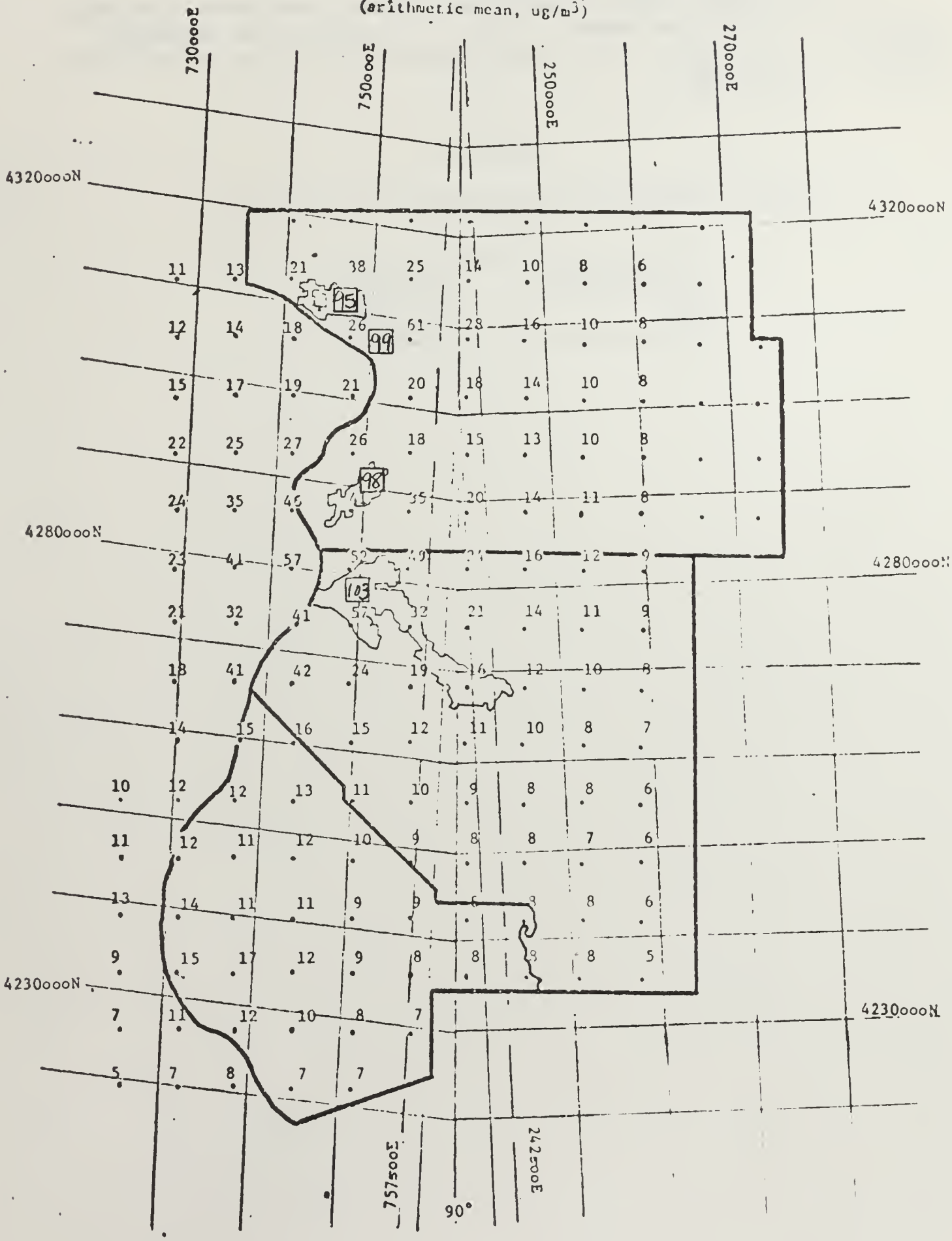


Figure 10
St. Louis MMA
SO_2 Ambient Air Quality
(arithmetic mean, ug/m^3)



For "other" MMA's (Champaign, McLean, Macon, Rock Island, Sangamon, Winnebago) use the value shown in Table 1 to represent the background pollutant concentration. The chosen value should be added to the value obtained from the CDM.

Table 1

Assumed background concentration in "Other MMA's"

Particulates	60 ug/m^3
SO_2	40 ug/m^3

NOTE: PAGES 17 THRU 26 HAVE BEEN REVISED AS SHOWN IN APPENDIX C

Table 2

DIRECTORY OF AIR QUALITY MONITORING SITES
SITES OPERATED DURING 1975

	SITE	ADDRESS	OWNER/OPERATOR	PARTICULATES (ug/m^3) SGD	PARTICULATES (ug/m^3) GEO. MEAN	SO2 SGD	SO2 ARITH. MEAN
REGION 65 BURLINGTON-KEOKUK INTERSTATE (ILL.-IOWA)							
	KNOX COUNTY						
1	Galesburg (2740 001)	Library Main Street	Ill. EPA/City	1.24	73.4		
—	Galesburg (NEW) (2740 002)	City Hall 72 Cherry Street	Ill. EPA/City				
	PEORIA COUNTY						
2	Peoria (6080 001)	610 NE Jefferson	Ill. EPA/Peoria Inspections	1.24	91.1		
2	Peoria (6080 001)	610 NE Jefferson	US EPA/Peoria Inspections Dept.			1.64	49.42
2	Peoria (6080 023)	Firestation #4 2711 SW Jefferson	Ill. EPA/Peoria Inspections Dept.	1.78	90.2	1.35	39.27
2	Peoria (6080 024)	Firestation #8 MacArthur & Hurlburt	Ill. EPA			2.88	70.69
2	Peoria (6080 027)	Maintainance Bldg. 1604 Detweiller	Ill. EPA/Peoria Inspections Dept.	1.20	58.5	1.37	18.33
2	Peoria (6080 028)	Olin Hall Bradley University	Ill. EPA/Bradley University	1.27	69.6	2.63	39.27
—	Peoria (NEW) (6080 029)	Salvation Army 407 NE Adams	Ill. EPA				
2	Peoria (NEW) (6080 030)	City Hall 419 Fulton	Ill. EPA/Peoria inspection Dept.			1.43	31.42
	TAZEWELL COUNTY						
3	East Peoria (2100 002)	East Peoria 235 E. Washington	Ill. EPA/Peoria Inspections Dept.	1.35	94.7		
—	East Peoria (NEW) (2100 003)	Illini Brick 1167 W. Washington	Ill. EPA/Peoria Inspections Dept.				
4	Pekin (6060 002)	531 Court	Ill. EPA/Cilco	1.59	76.5		
4	Pekin (6060 004)	Firestation #3 272 Derby	Ill. EPA			2.87	44.51
REGION 66 EAST CENTRAL ILLINOIS INTRASTATE							
	CHAMPAIGN COUNTY						
5	Champaign (1140 002)	Regional Office Bldg. 2125 S. First Street	Ill. EPA	1.40	46.2	1.78	10.47
	McLEAN COUNTY						
6	Bloomington (0480 001)	Pantograph Bldg. Washington & Madison	Ill. EPA	1.20	64.1	2.10	18.33
7	Normal (5560 001)	McLean Co. Health Dept. 401 W. Virginia	Ill. EPA			1.66	34.03

SITE DIRECTORY

	SITE	ADDRESS	OWNER/OPERATOR	PARTICULATES (ug/m³) SGD	PARTICULATES (ug/m³) GEO. MEAN	SO2 SGD	SO2 ARITH. MEAN
	VERMILION COUNTY						
—	Danville (NEW) (1720 002)	Vermilion Co. Court House 4 N. Vermilion	Ill. EPA/Vermilion County Health Dept.				
—	Danville (NEW-DISC) (1720 003)	Vermilion Co. Health Dept. Bldg. 808 N. Logan	Ill. EPA/Vermilion County Health Dept.				
—	Danville (DISC) (1720 001)	Bowman & Fairchild	Ill. EPA/Vermilion County Health Dept.				
	REGION 67 METROPOLITAN CHICAGO INTERSTATE (ILL.-IND.)						
	COOK COUNTY						
8	Arlington Hts. (0200 001)	33 S. Arlington Hts. Rd.	Cook Co. DEC	1.34	72.46		
9	Bedford Park (1540 002)	6535 S. Central	Bedford Park Env. Quality Control Board	1.91	102.48	1.52	28.80
9	Bedford Park (1540 015)	Community Park 6700 S. 78th Ave.	Bedford Park Env. Quality Control Board	1.60	90.0	1.94	15.71
10	Blue Island (0500 001)	Eisenhower High School 12700 Sacramento	Cook County OEC	1.19	91.9		
11	Calumet City (0780 001)	Thorton Fractional H.S. 755 Pulaski Road	Cook County DEC	1.40	77.4	1.63	78.54
	CITY OF CHICAGO						
12	Addams Elementary School (1220 031)	10810 S. Ave. H.	Chicago DEC	1.30	105.4	1.77	41.89
13	Anthony Elementary School (1220 030)	9800 S. Torrence Ave.	Chicago DEC	1.41	85.7	1.88	18.33
14	Austin H.S. (DISC.) (1220 006)	231 N. Pine	Chicago OEC			1.32	26.18
15	Austin West H.S. (NEW) (1220 036)	118 N. Central	Chicago DEC	1.63	90.1	1.89	26.18
16	Calumet H.S. (1220 016)	8131 S. May Street	Chicago DEC	1.39	68.7	2.30	23.56
17	Carver H.S. (1220 018)	801 E. 133rd Place	Chicago DEC	1.17	73.0	2.53	20.94
18	CAMP (1220 002)	445 Plymouth Ct.	US EPA/Chicago OEC	1.32	120.7	1.91	36.65
—	Cermak Pump Station (1220 026)	735 W. Harrison	Chicago OEC				
—	Chicago City Central Office Bldg. (1220 001)	320 N. Clark	US EPA/ Chicago OEC				
19	Chicago Vocational High School (1220 017)	2100 E. 87th Street	Chicago DEC	1.39	75.5	1.69	23.56
	Civic Center (NEW) (1220 035)	121 N. LaSalle	Chicago DEC				

SITE DIRECTORY

	SITE	ADDRESS	OWNER/OPERATOR	PARTICULATES (ug/m^3) SGD	PARTICULATES (ug/m^3) GEO. MEAN	SO2 SGD	SO2 ARITH. MEAN
20	Clay Elementry Sch. (1220 019)	13231 S. Burley Ave.	Chicago DEC	1.41	78.2	2.22	**23.56**
21	Cooley Vocational High School (1220 012)	1225 N. Sedgwick	Chicago DEC	1.27	94.4	1.96	41.89
—	Edgewater (NEW) (1220 037)	5358 N. Ashland Ave.	Chicago DEC				
22	Farr Dormitory (1220 014)	3300 S. Michigan Ave.	Chicago DEC	1.14	77.0		
23	Fenger High School (1220 010)	11220 S. Wallace	Chicago DEC	1.35	80.0	1.32	28.80
24	G.S.A. Bldg. (1220 005)	538 S. Clark	Chicago DEC	1.18	95.3	1.84	49.74
25	Hale Elementary Sch. (1220 021)	6140 S. Melvina Ave.	Chicago DEC	1.31	68.3	1.77	28.80
26	Kelly High School (1220 015)	4136 S. California Ave.	Chicago DEC	1.33	85.4	1.89	28.80
27	Kenwood High School (1220 025)	5015 Blackstone	Chicago DEC	1.17	65.3	1.89	23.56
28	Lakeview H.S. (1220 004)	4015 N. Ashland Ave.	Chicago DEC	1.15	70.1	1.44	34.0
29	Lindblom H.S. (1220 007)	6130 S. Wolcott Ave.	Chicago DEC	1.71	63.4	1.21	15.71
—	Crib (1220 034)	68th St. Lake Michigan	Chicago DEC				
30	Logan Sq. (Ill. Bell) (1220 028)	2940 W. Cortland Ave.	Chicago DEC	1.22	71.6		
31	Medical Center (1220 033)	1947 W. Polk	Ill. EPA	1.40	89.9	2.00	47.12
32	South Water Filtration Plt. (1220 032)	3300 E. Cheltenham Pl.	Chicago DEC	1.36	66.8	1.67	15.71
33	Steinmetz H.S. (1220 011)	3030 N. Mobile Ave.	Chicago DEC	1.69	67.20	1.47	18.33
34	Stevenson Elementary School (1220 009)	8010 S. Kostner Ave.	Chicago DEC	1.50	75.0	1.98	28.80
35	Sullivan High School (1220 020)	6631 N. Bosworth Ave.	Chicago DEC	1.37	57.1	2.61	15.71
—	Sunnyside & Knox (1220 027)	4632 W. Sunnyside	Chicago DEC				
36	Taft High School (1220 003)	5625 N. Natoma Avenue	Chicago DEC	1.13	60.0	1.88	18.33
37	VonSteuben H.S. (1220 029)	5039 N. Kimball Avenue	Chicago DEC	1.08	70.4		
38	Washington H.S. (1220 022)	3500 E. 114th Street	Chicago DEC	1.39	148.0	1.34	34.03

SITE DIRECTORY

	SITE	ADDRESS	OWNER/OPERATOR	PARTICULATES (ug/m³) SGD	PARTICULATES (ug/m³) GEO. MEAN	SO2 SGD	SO2 ARITH. MEAN
39	Chicago Heights (1240 003)	450 State Street Dawes Lab.	Ill. EPA/Dawes Labs	1.57	138.7		
40	Chicago Heights (1240 001)	Bloom High School Dixie Hwy, & 10th Street	Cook County DEC	1.23	62.6		
41	Cicero (1340 001)	Roosevelt High School 15th Street & 50th Ave.	Cook County DEC	1.34	90.4		
42	DesPlaines (1840 001)	Maine West High School 1755 S. Wolf Road	Cook County DEC			1.20	61.3
43	Evanston (2360 001)	Police Department 1454 Elmwood	Ill. EPA/City	1.18	40.8		
44	Flossmoor (2520 001)	Community High School 999 Kedzie Ave.	Cook County DEC	1.37	57.9		
45	Franklin Park (2620 001)	E. Leyden High School 3400 N. Rose Street	Cook County DEC	1.26	70.4		
46	Glenview (2940 001)	Village Hall 1930 Prairie Street	Ill. EPA/City	1.42	52.5		
47	Harvey (3180 001)	Lowell School 157th & Lexington	Cook County DEC	1.24	78.9		
48	Hillside (3420 001)	Proviso W. High School Wolf Road & Harrison St.	Cook County DEC	1.24	67.8		
49	McCook (1540 016)	Village Hall 50th Street & Glencoe	McCook Env. Board	1.32	103.6		
50	McCook (1540 017)	Rt. 66 & Lawndale	McCook Env. Board	1.29	98.7		
51	Midlothian (5080 001)	Breman High School 15205 Crawford Ave.	Cook County DEC	1.43	62.3		
52	Morton Grove (5320 001)	Fireside North 9111 Waukegan	Morton Grove Air Pollution Control Board	1.58	62.8		
53	Niles (5540 001)	Gemini High School 8955 Greenwood Ave.	Cook County DEC	1.46	68.2		
54	Oak Park (5740 002)	834 Lake Street	Cook County DEC	1.29	53.4		
55	Orland Park (5860 001)	Carl Sandburg High School 133rd & Lagrange Road	Cook County DEC	1.22	64.9		
56	Palatine (5900 001)	Township High School 1000 Quentin Road	Cook County DEC	1.17	50.5		
57	Park Forest (6000 001)	Water Filtration Plant 100 Park Ave.	Cook County DEC	1.30	51.4		
58	River Forest (6540 001)	Jr. High School Lathrop & Oak Avenues	Cook County DEC	1.37	67.4		
—	Skokie (DISC.) (7160 003)	5127 Oakton	Ill. EPA/City Health Department				
—	Skokie (7160 005)	Niles N. High School 9800 Lawler	Cook County DEC				
59	Skokie (7160 006)	Golf Course 4401 Dempster	Ill. EPA/City Health Department	1.20	39.0		
60	Skokie (NEW) (7160 007)	Niles East High School 7701 Lincoln Ave.	Ill. EPA/ City Health Department	1.41	43.7		
61	Summit (7520 001)	Graves School 60th & 74th Ave.	Cook County DEC	**1.26**	**88.9**		

SITE DIRECTORY

	SITE	ADDRESS	OWNER/OPERATOR	PARTICULATES (ug/m³) SGD	PARTICULATES (ug/m³) GEO. MEAN	SO2 SGD	SO2 ARITH. MEAN
62	Wilmette (8360 001)	Central School 9th St. & Central Ave.	Cook County OEC	1.23	48.3		
63	Winnetka (8420 001)	Crow Island School 112 Willow Road	Ill. EPA/Evanston North Shore H.O.	1.34	38.5		
	DuPAGE COUNTY						
64	Addison (0060 001)	City Hall 130 W. Army Trail Road	DuPage County Health Dept.	1.35	68.1		
65	Bensenville (0380 001)	N. Fire Station Main & York Road	Ill. EPA/City	1.32	93.4		
65	Bensenville (0380 002)	Beeline Fashions 375 Meyer	Ill. EPA/City	1.28	54.6	2.19	28.80
66	Downers Grove (1940 001)	801 Burlington	Ill. EPA/City Russ Schultz	1.50	68.7		
67	Elmhurst (2300 001)	Police Station 118 Schiller	DuPage County Health Dept.	1.34	68.9		
68	Naperville (5480 001)	Fire Station 175 Jackson Street	DuPage County Health Dept.	1.57	68.4		
69	West Chicago (8080 001)	DuPage County Airport	DuPage County Health Dept.	1.95	67.8		
69	West Chicago (8080 002)	Police Station 222 Willow St.	DuPage County Health Dept.	1.12	70.1		
	Wheaton (8220 002)	Court House 201 Reber St.	DuPage County Health Dept.	1.55	68.2		
—	Wheaton (8220 003)	111 N. Country	DuPage County Health Dept.				
	KANKAKEE COUNTY						
—	Bradley (0580 001)	E. Elementary School 610 E. Liberty St.	Ill. EPA/George Serakine				
	KANE COUNTY						
71	Elgin (2260 001)	Modern Dairy 1002 N. Liberty	Ill. EPA/City	1.27	59.7		
	KENDALL COUNTY						
72	Plano (6280 001)	City Hall Main Street	Ill. EPA/MRS. Aterburn	1.80	63.8		
	LAKE COUNTY						
73	Island Lake (4000 001)	Island Lake Grade School	Lake County Health Dept.	1.33	46.9		
74	Lake Bluff (4020 001)	E. Elementary School 121 E. Sheridan Place	Lake County Health Dept.	1.43	42.0		
75	North Chicago (5620 002)	1850 Lewis Ave.	US EPA/Lake Co. Health Dept.			1.32	55.5
76	Waukegan (8020 001)	City Hall 160 Utica	Ill. EPA/Lake Co. Health Dept.	1.49	65.5		
—	Waukegan (8020 002)	N. Fire Station Golf & Jackson	Lake County Health Dept.				
—	Waukegan (8020 003)	W. High School 2200 Brookside	Lake County Health Dept.				
77	Waukegan (8020 004)	County Health Dept. 3010 Grand Avenue	Ill. EPA/Lake Co. Health Dept.			2.22	20.94

SITE DIRECTORY

	SITE	ADDRESS	OWNER/OPERATOR	PARTICULATES (ug/m³) SGD	PARTICULATES (ug/m³) GEO. MEAN	SO2 SGD	SO2 ARITH. MEAN
	McHENRY COUNTY						
77	Cary (1020 001)	Cary High School 1st St. & Three Oaks Rd.	Ill. EPA/City High School	1.50	42.4		
78	Crystal Lake (1680 002)	Franklin & Caroline St.	Ill. EPA/City	1.14	45.6		
	WILL COUNTY						
79	Crete (1540 001)	Crete Grammar School North & Elizabeth Sts.	Will County Health Dept.	1.24	60.2		
80	Joliet (3760 001)	Rialto Bldg. 5 E. Vanburen	US EPA/Will Co. Health Dept.	1.08	78.0		
80	Joliet (3760 002)	Pershing School Midland & Campbell	Will County Health Dept.	1.31	70.7	1.39	18.33
80	Joliet (3760 003)	Rivals Park 3425 N. Broadway	Will County Health Dept.	1.41	77.8	2.32	13.09
80	Joliet (3760 004)	Gompers School Copperfield & Briggs	Will County Health Dept.	1.18	72.5		
80	Joliet (3760 005)	Joliet & Benton Sts.	Ill. EPA/Ill. EPA			2.30	41.89
80	Joliet (3760 006)	Joliet Jr. College 1216 Houbolt St.	Will County Health Dept.	1.50	53.4	2.48	10.47
80	Joliet (3760 007)	Will County Health Dept. Bldg. 501 Ella Ave.	Will County Health Dept.	1.88	79.4		
—	Joliet (NEW)(OISC) (3760 008)	Old Elm & South Chicago Street	Will County Dept. of Public Health				
81	Lockport (4380 002)	5th & Madison	Will County Health Dept.	1.32	70.3	1.78	15.71
82	Monee (8320 005)	132 E. Main Street	Will County Health Dept.	1.30	48.5		
83	Mokena (8320 006)	10940 Front Street	Will County Health Dept.	1.97	61.4		
84	Plainfield (6270 001)	Indian Trail Jr. High 1005 Eastern	Will County Health Dept.	1.07	68.4		
85	Rockdale (8320 004)	Well #2 Pumping Station	Will County Health Dept.	1.22	96.84	1.77	18.33
86	Romeoville (6760 002)	Naperville Road	Will County Health Dept.	1.15	64.8		
87	Wilmington (8380 002)	201 N. Main	Will County Health Dept.	1.22	68.8		
	REGION 68 METROPOLITAN DUBUQUE INTERSTATE (ILL.-WIS.-IOWA)						
	Jo DAVIESS COUNTY						
88	Galena (2720 002)	Kraft Foods Commerce Plt.	Ill. EPA/JoDaviess County Health Dept.	1.57	69.5		
—	Galena	JoDaviess County Health Dept. Bldg.	Ill. EPA/JoDaviess County Health Dept.				
	REGION 69 METROPOLITAN QUAD CITIES INTERSTATE (ILL.-IOWA)						

SITE DIRECTORY

	SITE	ADDRESS	OWNER/OPERATOR	PARTICULATES (ug/m³) SGD	PARTICULATES (ug/m³) GEO. MEAN	SO2 SGD	SO2 ARITH. MEAN
	ROCK ISLAND COUNTY						
89	East Moline (2080 001)	City Hall 915 16th Ave.	Ill. EPA/Quad Cities Area Regional APC	1.18	81.9	2.07	20.94
90	Milan (5100 001)	Elementary School 125 W. 2nd Ave.	Ill. EPA/Quad Cities Area Regional APC	1.29	98.5		
91	Moline (5120 001)	City Hall 619 16th St.	U.S. EPA/City Health Dept.	1.55	79.7		
—	Moline (5120 001)	City Hall 619 16th St.	Ill. EPA/City Health Dept.				
91	Moline (5120 002)	Moline High School 360C 23rd Ave.	Ill. EPA/Quad Cities Area Regional APC	1.43	51.7		
92	Rock Island (6700 001)	1528 3rd Ave.	U.S. EPA/Quad Cities Area Regional APC	1.51	75.8		
92	Rock Island (6700 002)	1504 3rd Ave.	Ill. EPA/Quad Cities Area Regional APC			1.78	47.12
92	Rock Island (6700 003)	High School 1400 25th Ave.	Ill. EPA/Quad Cities Area Regional APC	1.16	60.5		
	WHITESIDE COUNTY						
93	Rock Falls (6660 001)	Rockfalls High School 101 12th Ave.	Whiteside County H.D./Rockfalls H.S.	2.12	71.4		
94	Sterling (7400 001)	Fire Station 110 W. 5th Street	Ill. EPA/Sterling H.S. (Barbara Booth)	1.67	61.8		
	REGION 70 METROPOLITAN ST. LOUIS INTERSTATE (ILL.-MO.)						
	MADISON COUNTY						
—	Alton (0160 004)	City Hall 103 E. 3rd Street	Ill. EPA				
95	Alton (0160 005)	Lowell School 1616 Joesting	Ill. EPA	1.13	67.1	1.13	41.89
96	Collinsville (1500 002)	EPA Office 115A W. Main	Ill. EPA	1.18	67.7		
97	Edwardsville (2180 002)	Madison County Crt. House 132 N. Kansas	Ill. EPA	1.11	54.5		
98	Granite City (2960 006)	City Hall 2000 Edison Ave.	Ill. EPA	1.19	96.1		
98	Granite City (2960 007)	Fire Station #1 23rd & Madison	Granite City APC	1.29	105.3	1.32	41.89
98	Granite City (2960 008)	Lake School 2301 E. 23rd	Granite City APC	1.18	67.6		
98	Granite City (2960 009)	2001 E. 20th	Granite City APC	1.30	157.5		
98	Granite City (2960 010)	15th & Madison	Granite City APC	1.46	137.6		
98	Granite City (2960 011)	Fire Station #2 Roosevelt & Rock Road	Granite City APC	1.13	97.2		
98	Granite City (2960 012)	Granite City APC Office 2301 Adams	Granite City APC			1.86	52.36
9—	Wood River (8520 007)	Water Treatment Plant 54 Wolcott	Ill. EPA	1.58	80.8	1.18	65.45

SITE DIRECTORY

	SITE	ADDRESS	OWNER/OPERATOR	PARTICULATES (ug/m^3) SGD	PARTICULATES (ug/m^3) GEO. MEAN	SO2 SGD	SO2 ARITH. MEAN
	MONROE COUNTY						
100	Columbia (1520 001)	City Hall 208 S. Rapp	Ill. EPA	1.19	47.3		
	ST. CLAIR COUNTY						
101	Belleville (0320 001)	City Hall 101 S. Illinois	Ill. EPA	1.14	63.1		
102	Cahokia State Park (2120 009)	Business Route 40	Ill. EPA	1.29	102.7		
103	E. St. Louis (2120 002)	City Hall 7 Collinsville Ave.	Ill. EPA/City	1.22	80.2		
—	E. St. Louis (2120 004)	638 N. 20th Street	US EPA/East Side Health District				
103	E. St. Louis (2120 008)	Federal Bldg. 650 Missouri	Ill. EPA			2.14	73.30
	REGION 71 NORTH CENTRAL ILLINOIS INTRASTATE						
	BUREAU COUNTY						
104	DePue (0680 001)	Spayer Residency 1401 Marquette	Ill. EPA/Spayer	1.46	58.5		
	LaSALLE COUNTY						
105	LaSalle (4080 001)	Township High School 541 Chartes	Ill. EPA/Ill. EPA			2.51	10.47
—	Ottawa (DISC.) (5880 001)	Dept. of Trans. Bldg. 700 Norris	Ill. EPA				
106	Ottawa (5880 002)	Ottawa Township H.S. 211 E. Main	Ill. EPA/Mr. Robert Krabel	1.29	55.1	1.42	13.09
	MARSHALL COUNTY						
107	Henry (3275 001)	High School College St. Route 29	Ill EPA/Mr. Mike Geyer			1.84	7.85
	PUTNAM COUNTY						
108	Henneoin (6420 005)	Kuhne Residence 5th & High	Ill. EPA/Kuhne	1.35	47.8		
	REGION 72 PADUCAH-CAIRO INTERSTATE (ILL.-KY.)						
	MASSAC COUNTY						
109	Metropolis (5060 007)	Massac County Hospital	Ill. EPA	1.46	53.4	6.52	70.69
	REGION 73 ROCKFORD-JANESVILLE-BELOIT INTERSTATE (ILL.-WIS.)						
	DeKALB COUNTY						
110	DeKalb (1780 001)	Municipal Bldg. 200 So. 4th	Ill. EPA/DeKalb A&W Pol. Cont. Com.	1.63	64.7		
	WINNEBAGO COUNTY						
111	Rockford (6680 005)	Pump House 1528 18th Ave.	Ill. EPA/Winnebago Co. Health Dept.			2.17	44.51
111	Rockford (6680 008)	Jefferson High 2525 Ohio	Ill. EPA/Winnebago Co. Health Dept.	1.42	40.7		

SITE DIRECTORY

	SITE	ADDRESS	OWNER/OPERATOR	PARTICULATES (ug/m3) SGD	PARTICULATES (ug/m3) Geo. Mean	SO2 SGD	SO2 Arith. Mean
111	Rockford (6680 001)	Old City Hall 126 S. 1st Street	US EPA/Winnebago Co. Health Dept.	1.23	59.0		
	REGION 74 SOUTHEAST ILLINOIS INTRASTATE						
	EFFINGHAM COUNTY						
112	Effingham (2200 001)	USDA Bldg. 1015 S. Willow	Ill. EPA	1.49	57.7	2.34	13.09
	JACKSON COUNTY						
113	Carbondale (0840 001)	SIU E & T Bldg.	Ill. EPA/SIU	1.35	37.5		
	JEFFERSON COUNTY						
114	Mt. Vernon (DISC.) (5420 001)	Fire Station #2 27th and Logan Street	Ill. EPA	1.25	59.7	1.70	5.24
—	Mt. Vernon (NEW) (5420 002)	601 North 18th Street	Ill. EPA/Ill. EPA				
	WILLIAMSON COUNTY						
115	Marion (4720 001)	State Office Bldg. 2209 W. Main Street	Ill. EPA	1.47	45.6	2.30	39.27
	REGION 75 WEST CENTRAL ILLINOIS INTRASTATE						
	ADAMS COUNTY						
110	Quincy (6440 002)	Central Fire Station 9th & Vermont	Ill. EPA/City	1.41	60.6	2.36	34.03
116	Quincy (6440 003)	Sewage Plant	Ill. EPA/City	1.36	60.7		
116	Quincy (NEW) (6440 004)	Quincy College 18th And Elm	Ill. EPA/Quincy College			4.63	2.62
	CHRISTIAN COUNTY						
—	Edinburg (DISC.) (1320 001)	317 W. Franklin	Ill. EPA				
	MACON COUNTY						
117	Decatur (1740 002)	Grant School 22nd & Geddes	Ill. EPA	1.26	106.7		
—	Decatur (1740 003)	125 N. Franklin	Ill. EPA				
—	Decatur (1740 004)	Harris School 600 E. Garfield	Ill. EPA				
117	Decatur (1740 006)	Fire Station #4 2760 N. 22nd Street	Ill. EPA			1.94	36.65
117	Decatur (NEW) (1740 007)	Fire Station #1 Franklin and Wood	Ill. EPA			1.47	10.47
	MENARD COUNTY						
118	Petersburg (6170 001)	Monroe & Jackson	Ill. EPA	1.13	56.6		

SITE DIRECTORY

	SITE	ADDRESS	OWNER/OPERATOR	PARTICULATES (ug/m³) SGD	PARTICULATES (ug/m³) GEO. MEAN	SO2 SGD	SO2 ARITH. MEAN
	SANGAMON COUNTY						
1C119	Springfield (7280 001)	Municipal Bldg. 8th & Monroe	US EPA/City Dept. of Pub. Hlth. and Safety	1.06	68.3		
1C119	Springfield (7280 003)	224 W. Adams	Ill. EPA	1.47	69.8	1.46	34.03

EXPLANATION OF TERMS

Station Types - The first term indicates the one major geographical category that best describes the sampling site. The second term describes the dominating influence on the sampler within approximately a one-mile radius of the sampling site.

EQUIPMENT CODE SYMBOLS

TSP - Total Suspended Particulate
COH - Coefficient of Haze
SO_2 - Sulfur Dioxide
NO_2 - Nitrogen Dioxide
WS/WD - Wind Speed and Direction
CO - Carbon Monoxide
Meteor - Meteorological Parameters (eg. Rain Fall, Atmospheric Pressure, Solar Radiation, Temperature)
THC - Total Hydrocarbons
N-MHC - Non-Methane Hydrocarbons
NO - Nitric Oxide
O_3 - Ozone
H_2S - Hydrogen Sulfide

n - instrument installed during 1975
d - instrument removed during 1975
NEW - site started in 1975
DISC.- site discontinued in 1975

Table 3

Standard Geometric Deviations vs Ratio of Maximum 24-Hour Concentration to Annual Mean Concentration

SGD	R	SGD	R
1.00	1.00	2.09	6.68
1.04	1.12	2.13	6.92
1.08	1.25	2.16	7.16
1.12	1.38	2.19	7.40
1.16	1.52	2.23	7.64
1.20	1.67	2.26	7.89
1.24	1.82	2.29	8.13
1.27	1.98	2.33	8.38
1.31	2.14	2.36	8.63
1.35	2.31	2.39	8.88
1.39	2.48	2.42	9.13
1.42	2.65	2.46	9.38
1.46	2.84	2.49	9.64
1.50	3.02	2.52	9.89
1.53	3.21	2.55	10.15
1.57	3.40		
1.61	3.60	2.59	10.40
1.64	3.80	2.62	10.66
1.68	4.00	2.65	10.92
1.71	4.21	2.68	11.18
1.75	4.42	2.71	11.44
1.78	4.64	2.75	11.70
1.82	4.85	2.78	11.96
1.85	5.07	2.81	12.22
1.89	5.29	2.84	12.48
1.92	5.52	2.87	12.74
1.96	5.75	2.90	13.00
1.99	5.98	2.93	13.26
2.03	6.21	2.96	13.53
2.06	6.44	3.00	13.79
		3.03	14.05

Emission Limit Rule

$$E = X\ H_A^{.11}\ H_E^{\ 2}$$

Where: E = Total allowable emissions of particulates or SO_2 in pounds per hour from process or fuel combustion sources.

X for particulates = .066
X for SO_2 = .096

H_A (meters) = Average actual stack height as determined by method outlined below.

H_E (meters) = Effective height effluent release as determined by method outlined below.

Q_H (KCal/sec) = Heat emission rate as determined by method outlined below.

H (meters) = Plume rise.

T (Degrees Kelvin) = Exit temperature of stack gases.

V (meters/sec) = Exit velocity of stack gases at maximum heat input.

D (meters) = Diameter of stack.

STEP 1: Determine weighted average stack parameters utilizing the following formulae:

$$D = \frac{P_1D_1 + P_2D_2 + \ldots + P_ND_N}{100}$$

$$V = \frac{P_1V_1 + P_2V_2 + \ldots + P_NV_N}{100}$$

$$T = \frac{P_1T_1 + P_2T_2 + \ldots + P_NH_N}{100}$$

$$H_A = \frac{P_1H_1 + P2H_2 + \ldots + P_NH_N}{100}$$

(NOTE: $P_1 + P_2 + \ldots + P_N = 100$)

STEP 2: Calculate heat emission rate utilizing the following formula and the weighted average stack parameters obtained in Step 1:

$$Q_H = 67D^2V\ \left(\frac{T - 286}{T}\right)$$

STEP 3: Calculate plume rise utilizing the appropriate formula given below and the total heat emission rate obtained in Step 2:

$$\Delta H = \frac{1.58\ Q_H\ .6}{H_A .11} \qquad \text{for } Q_H \geq 1500$$

$$\Delta H = \frac{.54\ Q_H .75}{H_A .11} \qquad \text{for } Q_H < 1500$$

STEP 4: Calculate the weighted average facility effective height of effluent release utilizing the plume rise obtained in Step 3, the average stack height obtained in Step 1 and the formula given below:

$$H_E = H_A + \Delta H$$

STEP 5: Calculate the total facility hourly emission limitation utilizing the weighted actual stack height obtained in Step 1, the effective stack height given in Step 4, and the following formula:

$$E = X\ H_A .11 H_E{}^2$$

NOTE:

P_i, i = 1, 2, . . ., n = percentage of total emissions, E, emitted from source i.

H_i, i = 1, 2, . . ., n = physical stack height in meters above grade of stack i.

D_i, i = 1, 2, . . ., n = stack diameter in meters of stack i.

T_i, i = 1, 2, . . ., n = exit temperature of gases from stack i.

V_i, i = 2, 2, . . ., n = exit velocity of gases from stack i.

April 1, 1975

APPENDIX B

HISTORICAL REVIEW AND JUSTIFICATION FOR PROCEDURES FOR DETERMINING THE AIR QUALITY IMPACT OF EMISSION SOURCES APPLYING FOR CONSTRUCTION PERMITS

On April 30, 1971, the Administrator of the Federal Environmental Protection Agency promulgated National Ambient Air Quality Standards. The primary standards were designed to protect the public health with an adequate margin of safety. The secondary standards specified levels of air quality which protect the public welfare from all known or anticipated adverse affects associated with the presence of such pollutants in the ambient air. The State of Illinois was required to develop a plan for the attainment and maintenance of these standards within the State. The plan, which has been approved by the USEPA, provided for the attainment of the primary and secondary ambient air quality standards by mid - 1975, and the maintenance of these standards through 1980.

The USEPA published in 40 CFR 51 "Requirements for the Preparation, Adoption and Submittal of Implementation Plans." These Federal guidelines allowed for the development of emission control strategies based on "example region" analyses. Emission control strategies developed as a result of these "example region" studies were adequate to control air pollution levels in the most polluted portions of the State and thereby were deemed sufficient for the remainder of the State. The Illinois Implementation Plan was developed using this "example region" approach.

The development of the State Implementation Plan involved a systems analyses approach to air resource management. The USEPA, in consultation with the Illinois EPA, divided the State into 11 air quality regions as shown in Figure 1. The nature of the air quality problem in each region was determined through air quality monitoring or estimation studies. A comparison of the observed or expected levels of air contaminants with the desired goals, the National Primary and Secondary Ambient Air Quality Standards, defined the magnitude of the control problem. Each region was categorized as a Priority I, Priority II, or Priority III region for each contaminant (particulate and sulfur dioxide). The classification of the air quality control regions in Illinois and the criteria used in arriving at the classifications are shown in Tables I and II. Mathematical models which translated emissions of air contaminants into estimates of air quality were developed. These models then served to predict the effectiveness of alternate emission control regulations upon air quality levels. These predictions permitted the evaluation of alternate solutions to the basic problem of achieving and maintaining the National Ambient Air Quality Standards.

As previously mentioned, the emission control standards and limitations were developed as a result of a detailed study of the air quality problem in the "example regions" of the State. Since the regulations were developed with sufficient stringency to maintain the secondary ambient air quality standards in these regions, the ambient air quality in other areas of the State should be maintained at or below the secondary ambient air quality standards.

The emission control standards and limitations were designed to achieve National Primary and Secondary Ambient Air Quality Standards by mid-1975. However, we find that the air quality in certain portions of the "example regions" is above the ambient air quality standards. This fact is due in part to a lack of full compliance with the emission standards and limitations. A portion of this non-compliance can be attributed to justifiable variances and delayed compliance programs. Therefore, mid-1975 represents a midstream period in our attempts to achieve compliance with National Ambient Air Quality Standards. The emission standards and limitations have no doubt had an effect in reducing contaminant levels and air quality will continue to improve as more and more compliance is achieved.

The Division of Air Pollution Control has undertaken a program to evaluate the effectiveness of the control strategies developed as a part of the State Implementation Plan. The evaluation, which will be based on a revised and updated emission inventory, more accurate air quality data, and more sophisticated dispersion modeling, will take sometime to accomplish. In the interim, it is necessary to comply with the rules and regulations governing the granting of construction permits relative to air quality.

These rules require that an applicant for a construction permit prove that the source to be built will not "prevent the attainment or maintenance of any applicable ambient air quality standard." As stationary sources are involved, the applicable standards are the Federal and State primary short and long-term particulate and SO_2 limits.

In making a determination of the impact on air quality of a proposed emission source, it is appropriate to refer to the results of the studies used as a basis for the development of the emission standards and limitations. Such studies provide forecasts of air quality levels. Figures 2 through 7 present isopleth maps of ground-level pollutant concentrations for 1980 in the three "example regions". Since the emission standards and limitations were developed for these "worst regions" of the state, it is assumed that the maximum ambient air quality levels for 1980 are represented in these figures. If all particulate and sulfur dioxide emission sources are in compliance with the emission standards and limitations, if industrial growth has been correctly estimated, and if the emission standards and limitations have been adequately devised, then the sulfur dioxide and particulate ambient air quality in 1980 would be expected to conform with that shown in Figures 2 through 7. The air quality in other portions of the state would be at or below the secondary standards.

For purposes of assessing the impact of new emission sources on air quality it is necessary to forecast general air quality levels in the areas where the new sources will be located. The 1980 isopleth maps discussed above may be used for the Chicago, St. Louis (Illinois), and Peoria Major Metropolitan Areas. These maps are appropriate since they represent annual air quality if existing sources are in compliance.

As explained above, sulfur dioxide and particulate levels in the remaining portions of the state are expected to be at or below the secondary standards by 1980. An examination of the data in Table III indicates that particulate levels in the remaining major metropolitan areas are generally at or above the annual secondary standard. Sulfur dioxide levels are below the old annual secondary standard. Thus, it appears reasonable to assume an annual geometric mean for particulates of 60 ug/m^3 and an annual arithmetic mean for sulfur dioxide of 40 ug/m^3 for the 1980 "background" levels in these areas.

Sulfur dioxide and particulate levels are expected to be lower in non-metropolitan areas. Although Illinois has had only one monitoring site which may be categorized as "rural", data does exists which indicates rural air quality levels. Tables IV and V contain such data and these data compare favorably with the data obtained by the Illinois EPA from the monitoring site at the Carlyle Reservoir. The 1973 annual arithmetic mean for sulfur dioxide and annual geometric mean for particulate from Carlyle were 21 ug/m^3 and 35 ug/m^3 respectively. Thus, it appears reasonable to assume a 1980 non-metropolitan "background" level of 35 ug/m^3 (annual geometric mean) for particulates and 15 ug/m^3 (annual arithmetic mean) for sulfur dioxide.

It is necessary to project the maximum 24-hour ambient air quality level which will be achieved as a result of the new source for comparison to short-term air quality standards. This can be done via a statistical technique described by Larsen (1) and modified according to a procedure developed by Curran and Frank(2). The technique requires a knowledge of the annual mean concentration and a derivation of the standard geometric deviation for the pollutant of concern. Such data are available for metropolitan areas but not for rural areas. Therefore, in rural areas the maximum 24-hour concentration due to the new source will be calculated for a "worst case" meteorological situation. This calculated concentration will then be compared to the standard. The worst case for elevated sources will be that found in 40CFR51 Appendix A. For ground level sources the same technique will be employed but a ground-based inversion will be substituted for the trapping situation.

The procedures for determining the air quality impact of emission sources applying for construction permits can be summarized as follows:

Chicago, Peoria and St. Louis (Illinois) Major Metropolitan Areas

1. The emissions from all new sources combined with the difference between controlled and uncontrolled emissions from existing sources not expected to be in compliance when the new source becomes operational (owned by the same owner) will be modeled for their impact on annual air quality. The results will represent the facility's contribution to ground-level air quality in excess of that provided for in the development of the implementation plan. If this excess air quality superimposed on the expected 1980 air quality results in a violation of the primary air quality standards, the permit will be denied.

2. The maximum annual air quality resulting from the procedure described in paragraph 1 will be combined with an assumed standard geometric deviation to project a maximum 24-hour concentration. If this concentration is above the primary 24-hour standard, the permit will be denied.

Champaign-Urbana, Decatur, Rockford, Rock Island-Moline, Springfield, and Bloomington-Normal Major Metropolitan Areas

1) Same procedure as given above except that the annual mean shall be assumed to be 60 ug/m^3 for particulates and 40 ug/m^3 for sulfur dioxide.

2) Same procedure as given above.

All Other Areas

1) The same procedure as above except emissions from the existing facility, including the proposed new source(s), will be modeled. The annual mean shall be assumed to be 35 ug/m^3 for particulates and 15 ug/m^3 for sulfur dioxide (unless the emission inventory for the region indicates that a more detailed analysis to determine the background value is required).

2) Emissions from the existing facility, including the proposed new source(s), will be modeled using a short term model and applicable "worst case" meteorological assumptions. No "background" air quality will be assumed unless the emission inventory indicates that a more detailed analysis is required. The results will be compared to the applicable 24-hour standard.

After the results of the more detailed study of the effectiveness of the emission standards and limitations become available, the method outlined above will be replaced by a comprehensive regionalized air-quality evaluation and prediction scheme.

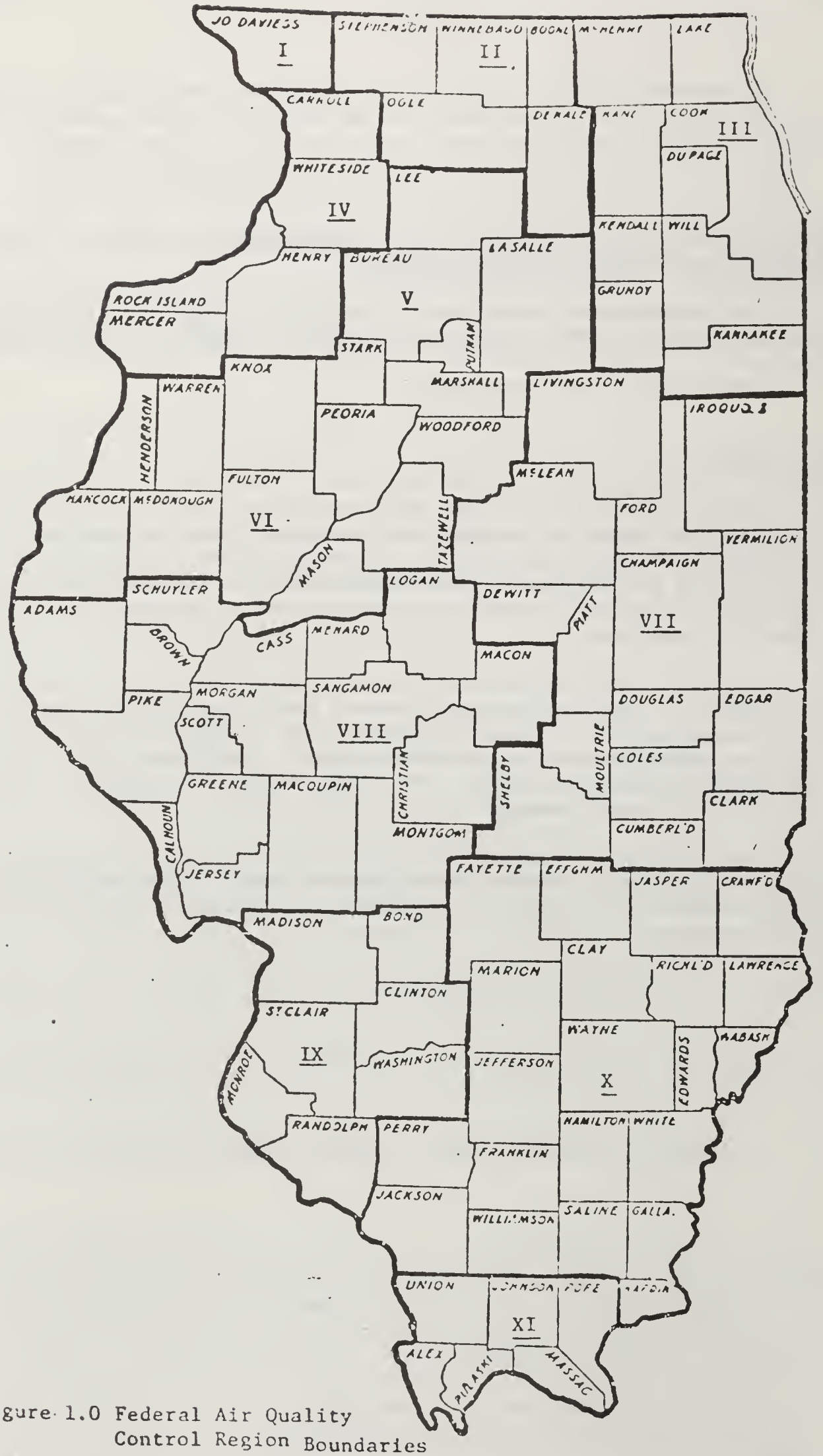
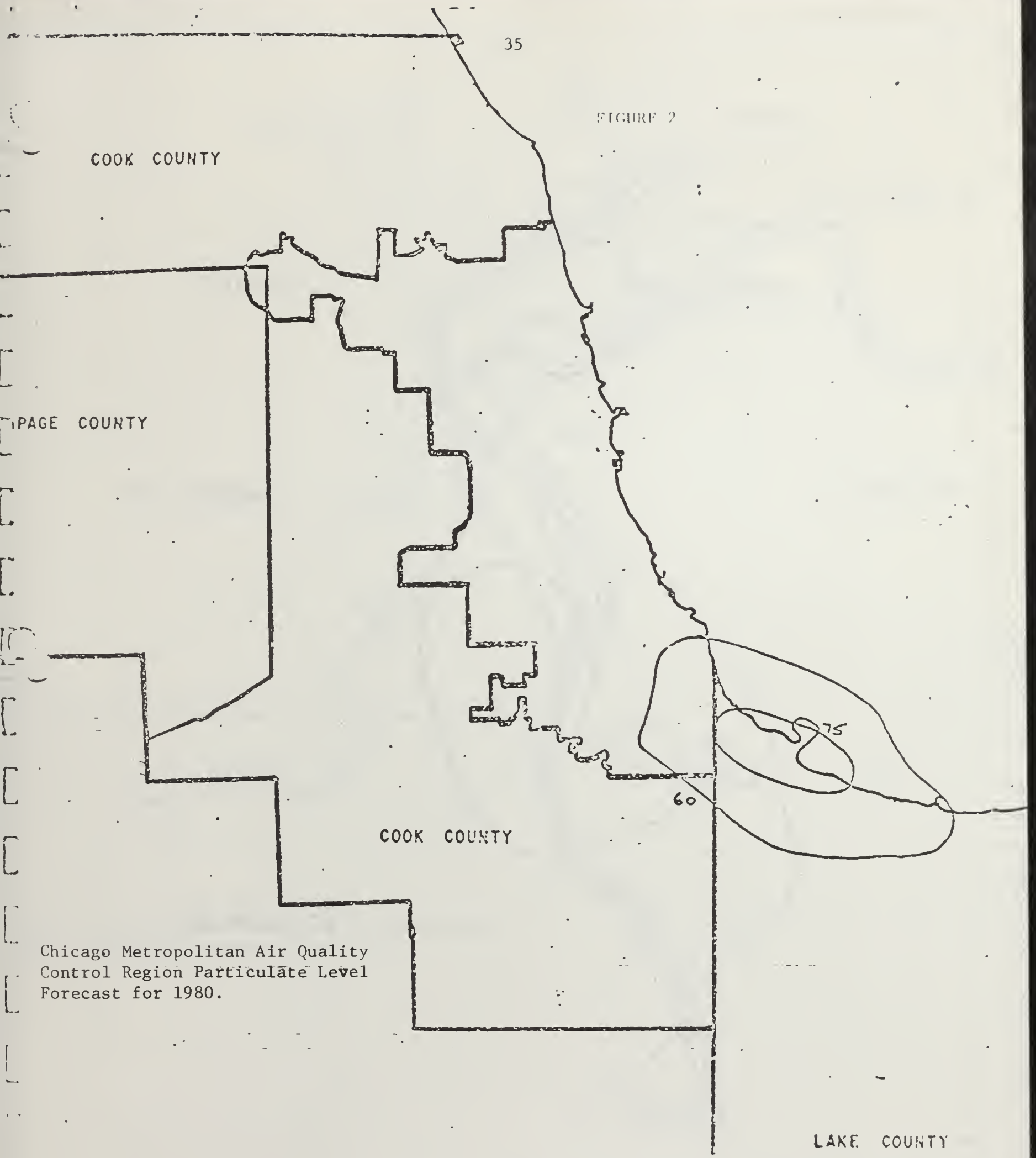


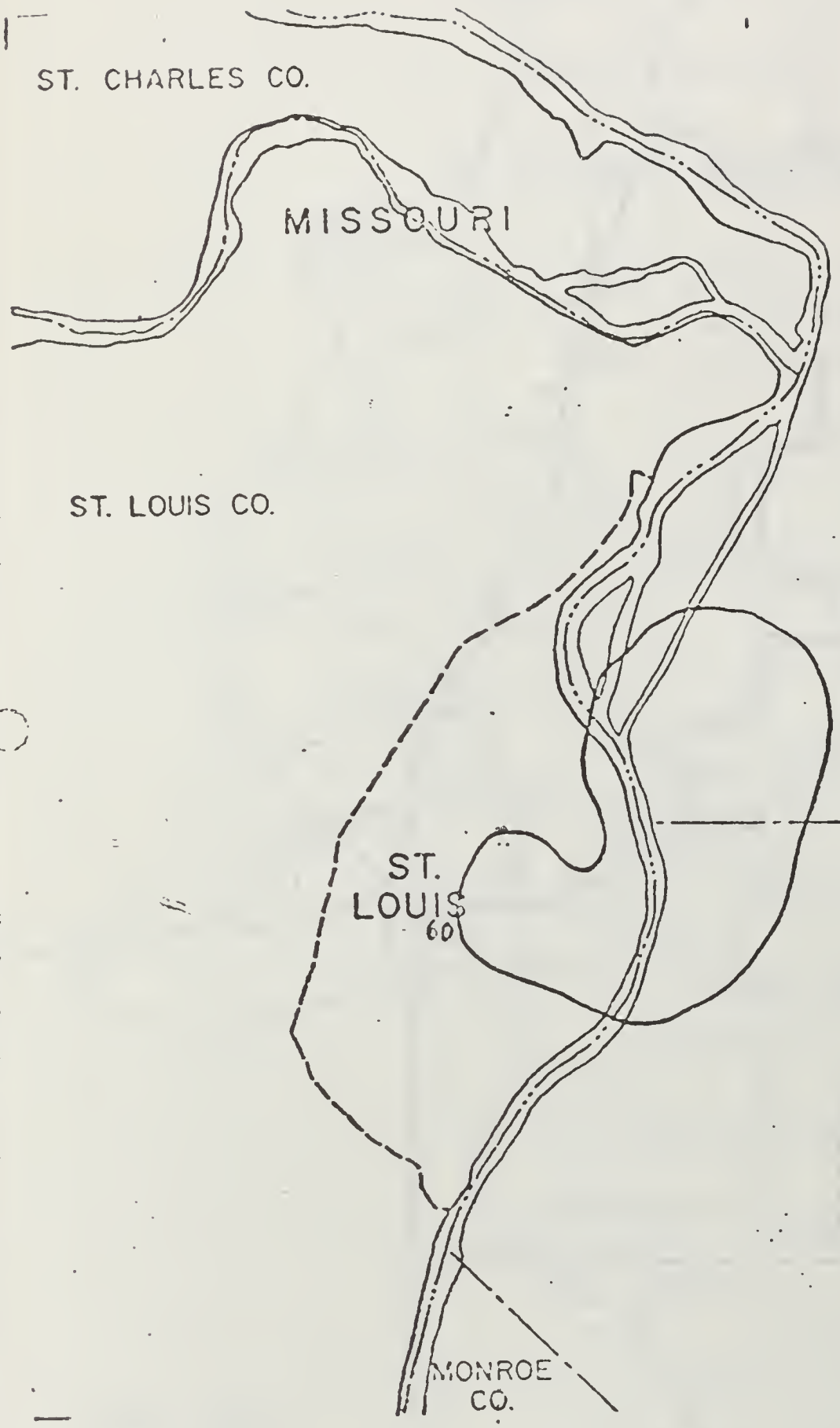
Figure 1.0 Federal Air Quality Control Region Boundaries

FIGURE 2



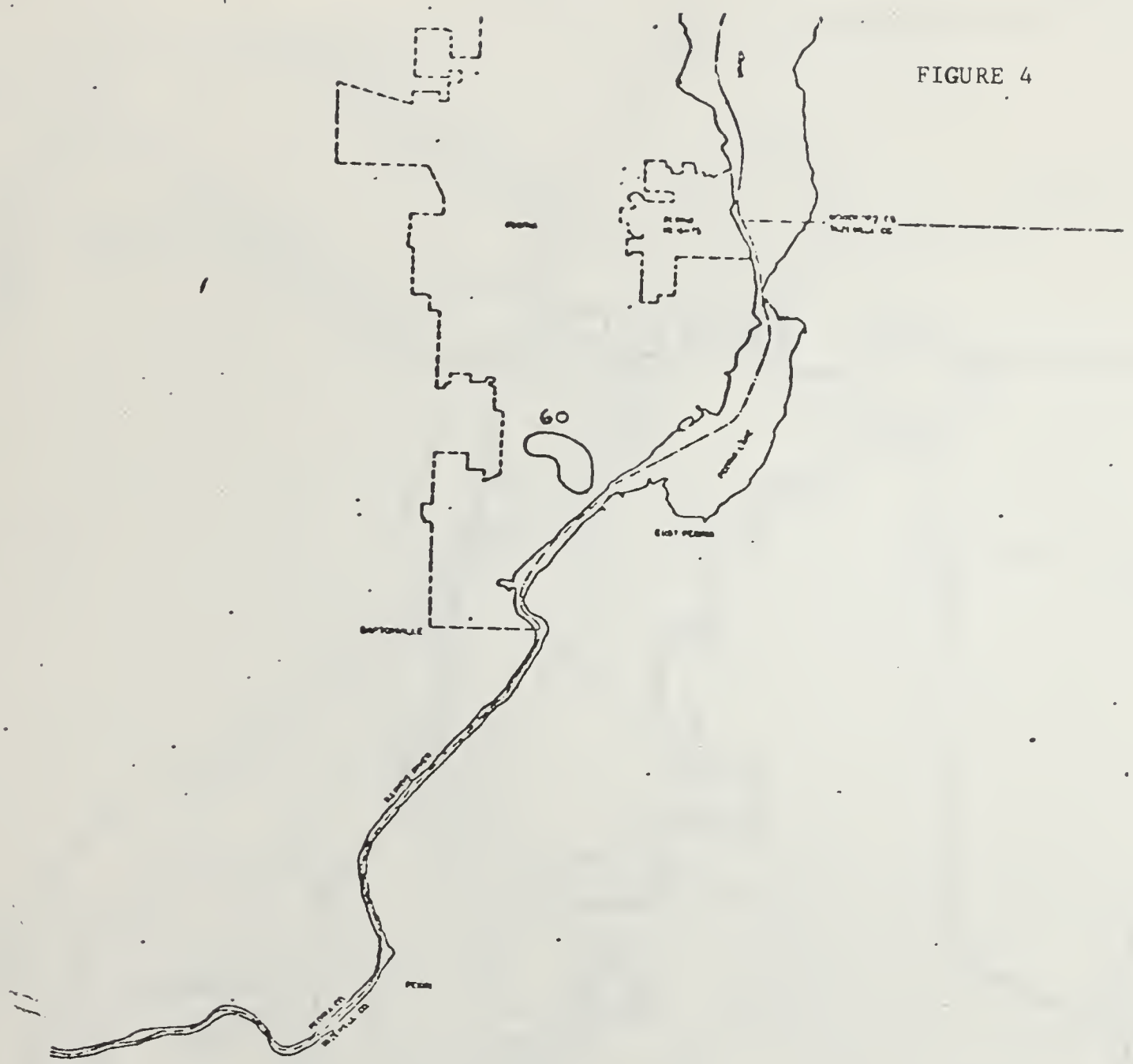
Chicago Metropolitan Air Quality Control Region Particulate Level Forecast for 1980.

FIGURE 3



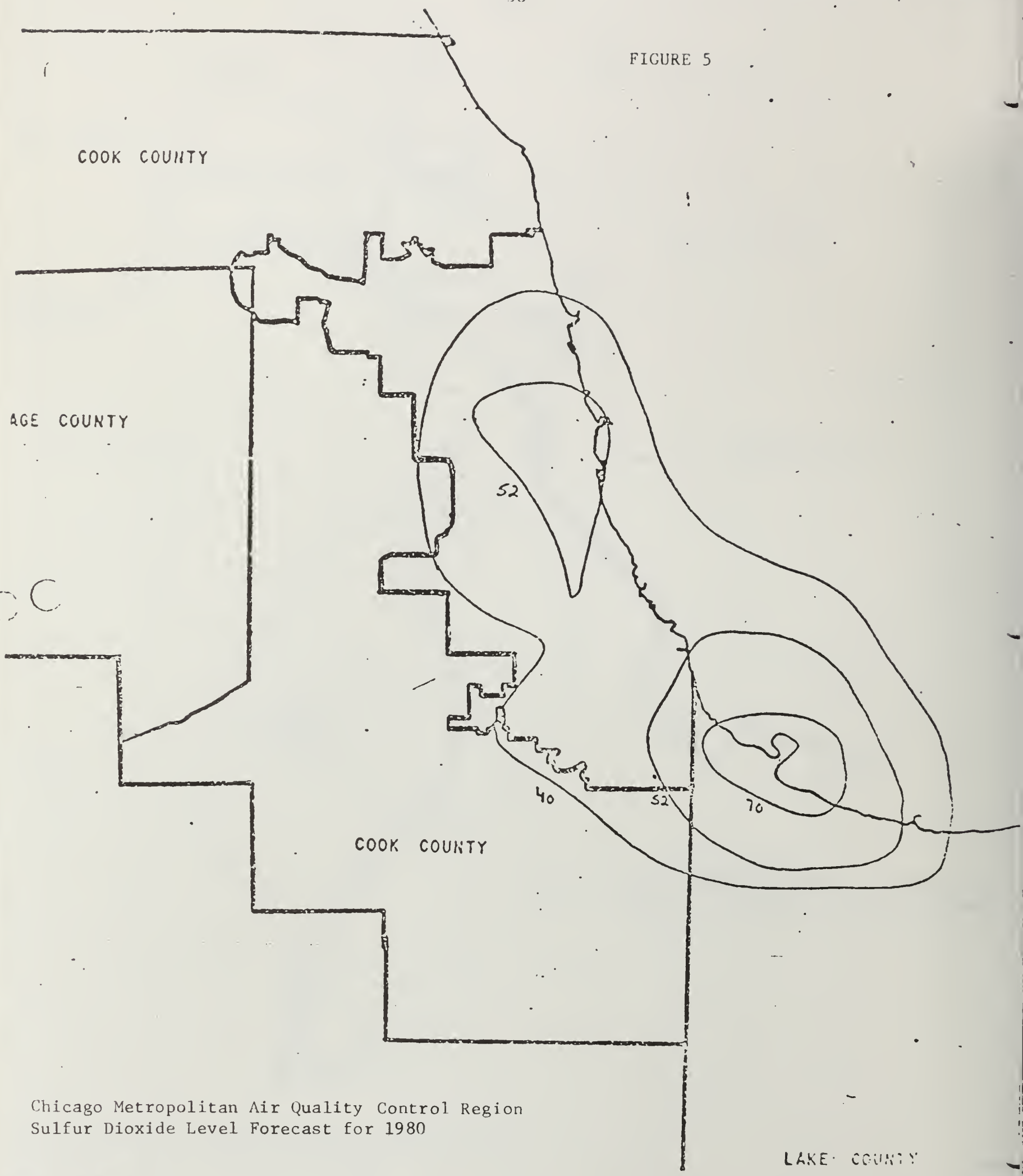
St. Louis Metropolitan Air Quality Control Region
Particulate Level Forecast for 1980.

FIGURE 4



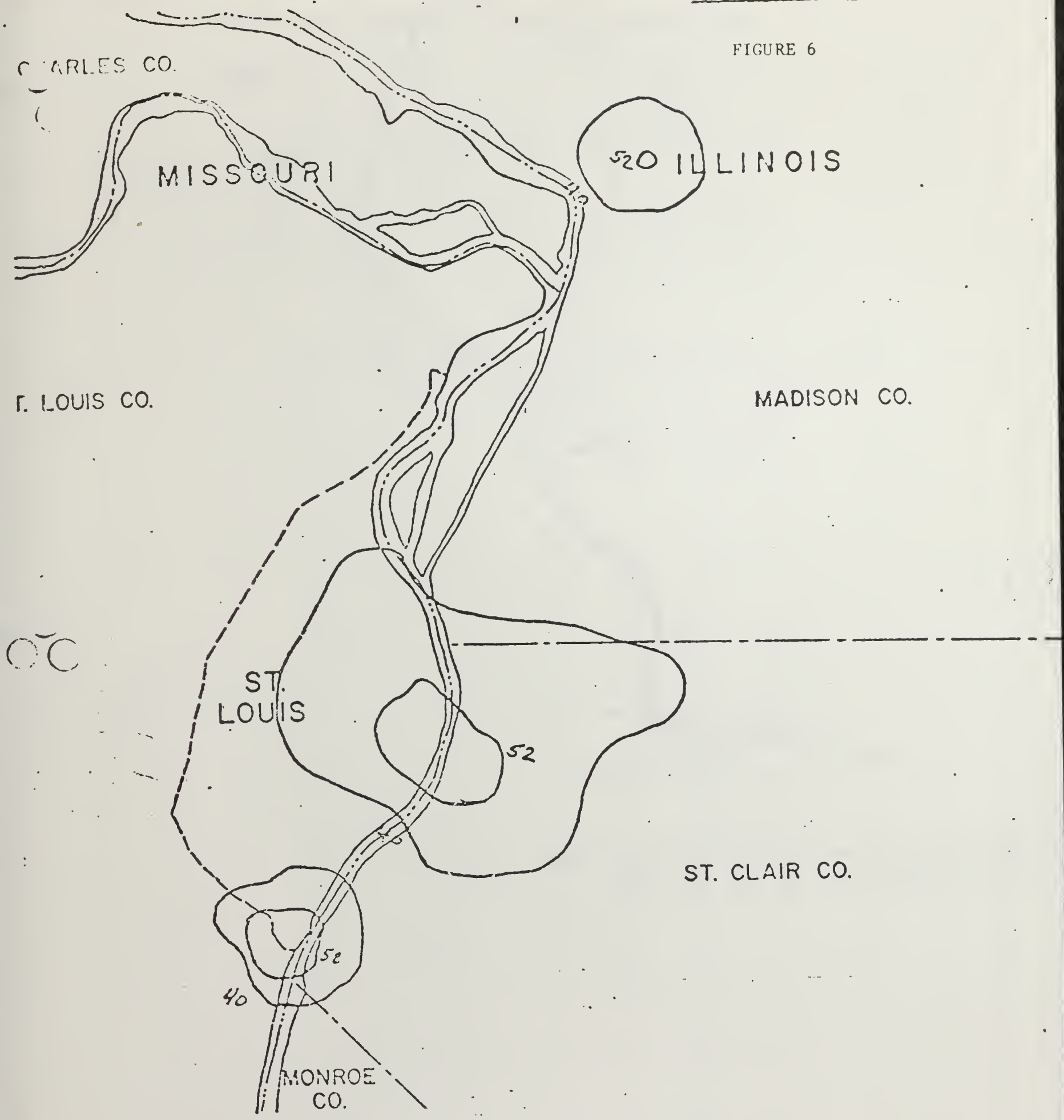
Peoria Metropolitan Air Quality Control Region
Particulate Level Forecast for 1980

FIGURE 5



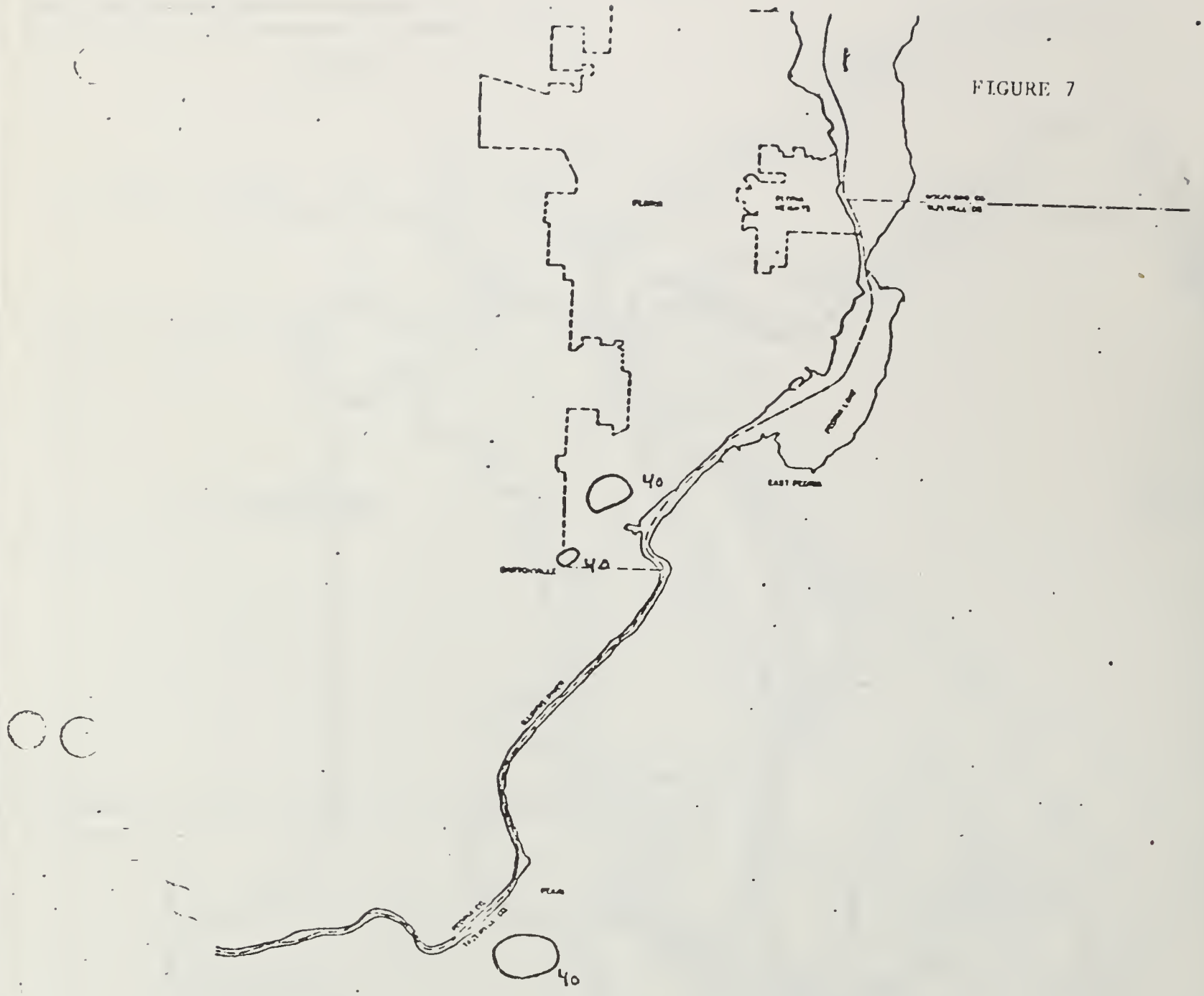
Chicago Metropolitan Air Quality Control Region
Sulfur Dioxide Level Forecast for 1980

FIGURE 6



St. Louis Metropolitan Air Quality Control Region
Sulfur Dioxide Level Forecast for 1980

FIGURE 7



Peoria Metropolitan Air Quality Control Region
Sulfur Dioxide Level Forecast for 1980

TABLE I

CRITERIA FOR DETERMINING AIR QUALITY CLASSIFICATIONS

Pollutant	Priority		
	I	II	III
Sulfur oxides:	Greater than	From-to	Less than
Annual arithmetic mean . .	0.04 ppm	0.02-0.04 ppm	0.02 ppm
24-hour maximum	0.17 ppm	0.10-0.17 ppm	0.10 ppm
3-hour maximum		0.50 ppm	0.50 ppm
Particulate matter:			
Annual geometric mean . .	95 ug/m^3	60-95 ug/m^3	60 ug/m^3
24-hour maximum	325 ug/m3	150-325 ug/m^3	150 ug/m^3

TABLE II

CLASSIFICATION OF AIR QUALITY CONTROL REGIONS IN ILLINOIS

	Air Quality Control Region	Particulate Matter	Sulfur Oxides
1	Metropolitan Dubuque Interstate	I	III
2	Rockford (Ill.)-Janesville-Beloit (Wis.) Interstate	II	III
3	Metropolitan Chicago Interstate (Ind.-Ill.)	I	I
4	Metropolitan Quad Cities Interstate	I	III
5	N. Central Ill. Intrastate	II	IA
6	Burlington-Keokuk Interstate	I	I
7	E. Central Ill. Intrastate	III	II
8	W. Central Ill. Intrastate	I	IA
9	Metropolitan St. Louis Interstate (Mo.-Ill.)	I	I
10	Southeast Ill. Intrastate	III	II
11	Peducah (Ky.)-Cairo (Ill.) Interstate	I	II

TABLE III

MAXIMUM ANNUAL AVERAGE SULFUR DIOXIDE AND PARTICULATE MATTER FOR SELECTED MAJOR METROPOLITAN AREAS

	Concentration (ug/m^3)							
	Particulate					Sulfur Dioxide		
MMA	1971	1972	1973	1974	1975	1973	1974	1975
Champaign-Urbana	72	58	63	50	46	-	18	10
Decatur (Macon)	105	83	112	98	107	13	37	37
Rockford (Winnebago)	71	72	63	50	65	27	48	44
Springfield (Sangamon)	111	86	67	72	70	48	32	34
Bloomington-Normal	84	96	48	58	64	18	27	34
Rock Island-Moline	90	96	87	96	98	29	37	47

NOTE: The above table may not be indicative of trends since in some cases monitors may have been relocated or added in areas of higher or lower pollutant concentrations.

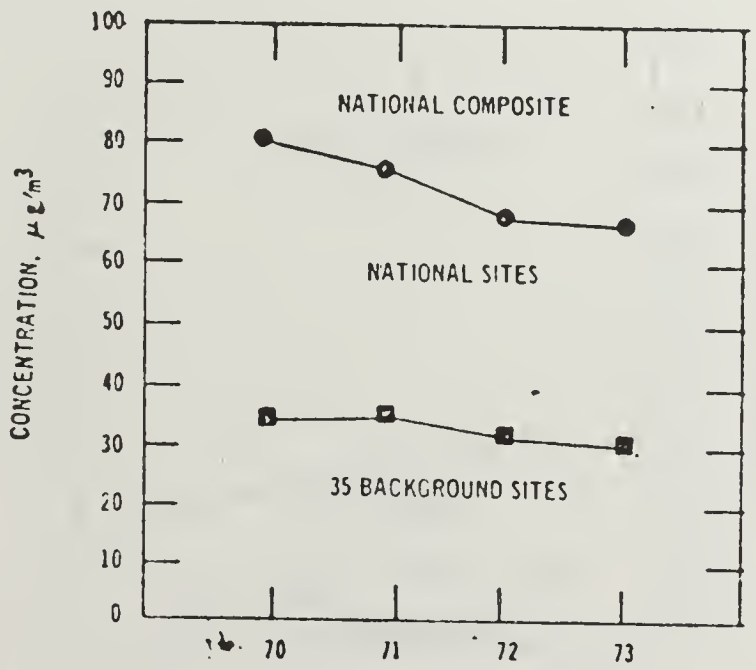
Secondary standard for particulates: 60 ug/m^3

Old secondary standard for sulfur dioxide: 60 ug/m^3

TABLE IV (3)

SURVEILLANCE CATEGORIES FOR TOTAL SUSPENDED PARTICULATE SITES
(number of sites)

Surveillance type	Geographical area					
	Northeast	South	North Central	Midwest	West	Nation
Population-oriented	333	95	179	243	75	925
Source-oriented	9	1	10	1	3	24
Background	8	3	7	11	6	35
Total	350	99	196	255	84	984

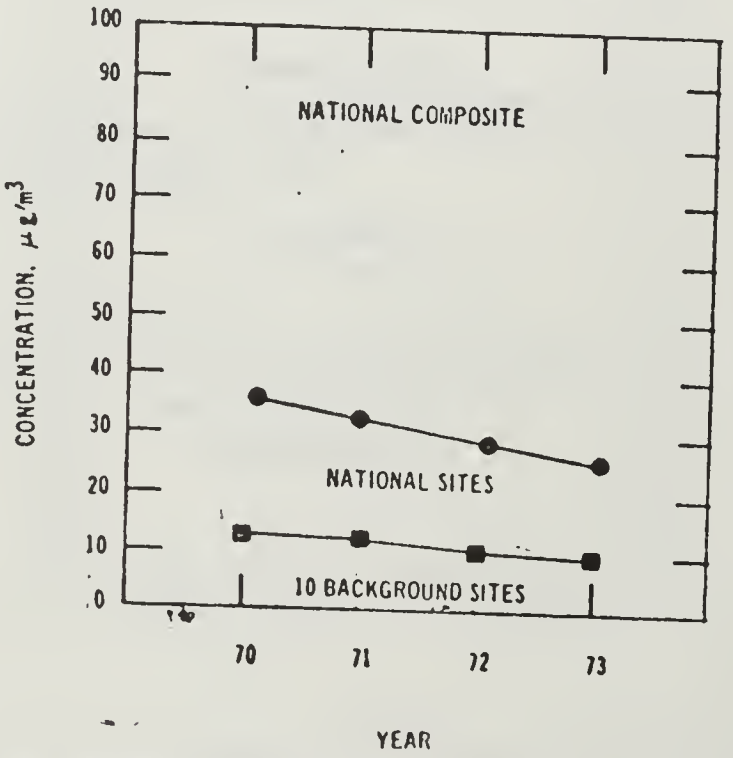


National and regional trends in total suspended particulate, 1970 - 1973.

TABLE V (3)

SURVEILLANCE CATEGORIES FOR SULFUR DIOXIDE SITES
(number of sites)

Surveillance type	Geographical area					
	Northeast	South	North Central	Midwest	West	Nation
Population-oriented	65	18	62	33	21	199
Source-oriented	1	1	2	0	0	4
Background	4	2	2	2	0	10
Total	70	21	66	35	21	213



National and regional trends in sulfur dioxide, 1970 - 1973.

APPENDIX C

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY **MEMORANDUM**

DATE: July 26, 1977

TO: Permit Section Personnel

FROM: Rob Kaleel RJK

SUBJECT: Permit Review Procedures

Attached is an update to the "Procedures for Determining the Impact on Air Quality of Proposed New Emission Sources". It replaces pages 17 thru 26 of the "Procedures" with 1976 air quality data. The data incorporated in these tables are to be used in new source reviews in the same manner as the data it replaces. An explanation of the method used in determining the data is also included.

RK:rc/B4

Attachment

Determination of the Impact of New Sources: An Update

The following package is a revision of IEPA's document, "Procedures for Determining the Impact on Air Quality of Proposed New Emission Sources". It replaces pages 17-26 of the document. The determination of the air quality impact of new sources is accomplished through the use of Larsen's statistical technique, which makes the basic assumption that air quality measurements collected over a year's time are distributed lognormally. This assumption has been found to be valid for the central portion of the distribution, but is not always true for observations on the "tails" of the curve. As a result, Larsen's technique often over-predicts the maximum concentration. An attempt has been made to correct the prediction of the maximum concentration, and these corrections are the purpose of this update.

Curran and Frank have shown in their study "Assessing the Validity of the Lognormal Model When Predicting Maximum Air Pollution Concentrations" that the upper tail of the distribution of annual air quality measurements tends to deviate or fall off from lognormal distribution. The result of this fact is that the predicted maximum concentration is significantly higher than the maximum concentration measured at the sight. This can be seen in Figure 1 which is a plot of TSP concentrations measured in Des Plaines, Illinois in 1975. Larsen's technique predicts a maximum concentration of 245 ug/m^3, when the actual maximum concentration was only 148 ug/m^3.

Subsequent studies conducted by the Air Resource Analysis Section have shown that in general the measurements begin to tail off at roughly the 90th percentile. By finding a new standard geometric deviation (SGD) which describes only the upper 10% of the distribution, a more reasonable prediction of the maximum concentration can be made. Larsen has shown in his report, "A Mathematical Model for Relating Air Quality Measurements to Air Quality Standards" that the standard geometric deviation of a distribtuion can be calculated from any two points on the curve (Larsen, equation 17). By picking the 90th percentile, and another point further up the curve, say the 99th percentile, the SGD for the upper tail can be calculated. This was done for the Des Plaines TSP data as shown in Figure 1. The predicted maximum in this case is 155 ug/m^3, vs. the actual maximum of 148 ug/m^3.

The update included here calculates a corrected SGD which is representative of the upper 10% of the distributions of air quality data collected in 1976 for all the monitors in the state. It does not include those monitors not meeting the minimum statistical criteria specified in IEPA's 1976 Air Quality Report.

For use in new source reviews, one other modification had to be made. The worksheet on page 5 of the "Procedures" encorporates the annual arithmetic mean, as well as the SGD. The corrected SGD will be used to determine the R value (ratio of the maximum value to the annual mean). Once the R value is found, it is multiplied by the corrected arithmetic mean shown in the update. The corrected arithmetic mean was determined from the distribution of the upper tail (see Figure 1). The line representing the 90-99 percentile distribution was drawn with a slope equal to the SGD. The line was extended back to the 50th percentile to find the corrected geometric mean, which was then converted to the corrected arithmetic mean. This value is not to be considered as representative of the annual distribution of measurements at each of the monitors. It is only to be used for estimating the maximum concentration by the method shown on page 5 of the Procedures.

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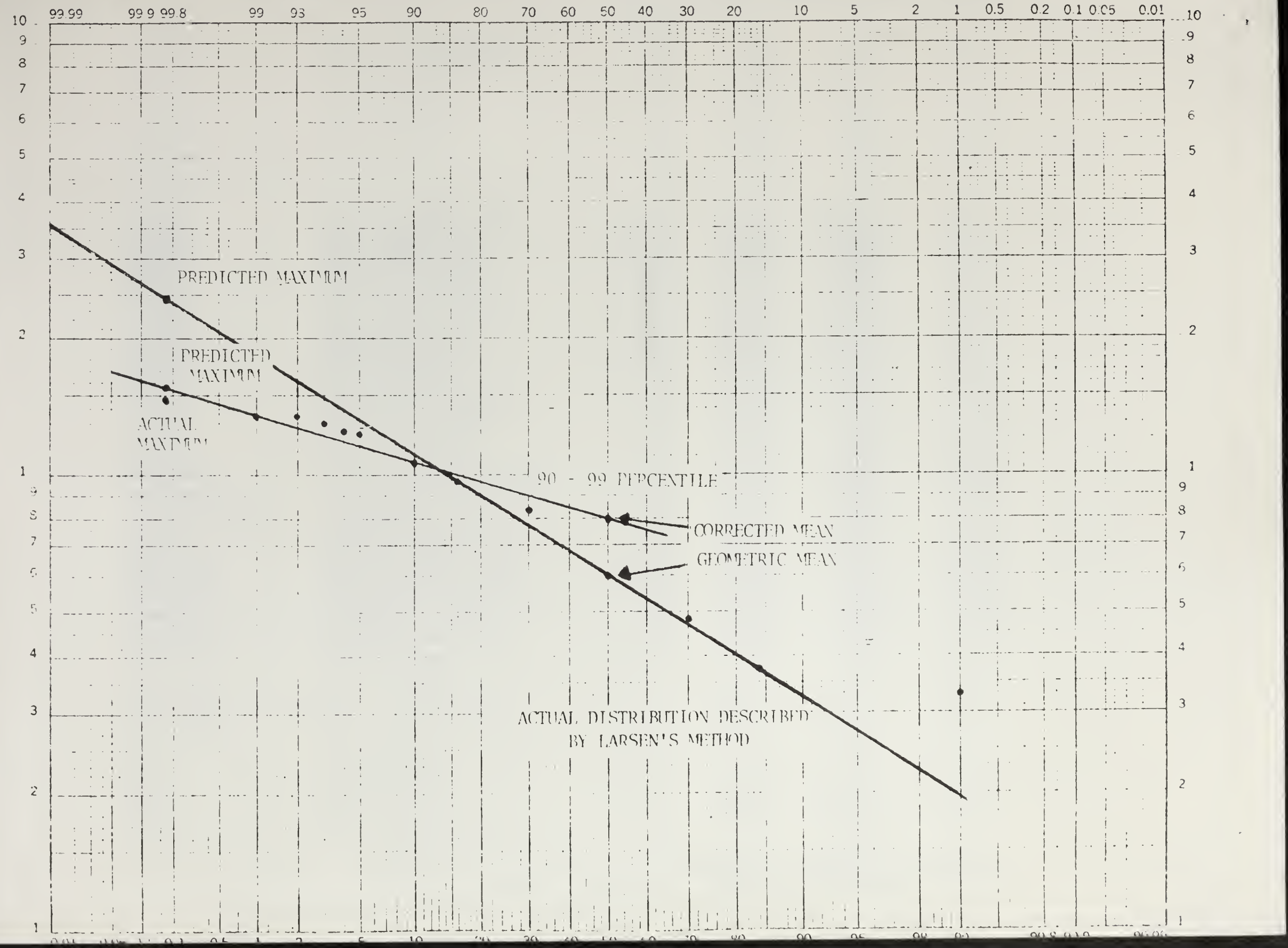

CITY	ADDRESS	POLLUTANT	CORRECTED ARITH. MEAN (UG/M3)	CORRECTED GEO. MEAN (UG/M3)	CORRECTED SGD
ADDISON	130 W ARMY TRAIL RD	TSP	50.08	35.29	2.31
ALTON	103 E 3RD ST	TSP	108.60	106.66	1.21
ALTON	1616 JOESTING	TSP	90.90	86.82	1.35
ALTON	1616 JOESTING	SO2	44.07	38.14	1.71
ALTON	1616 JOESTING*	SO2	78.60	65.67	1.82
ARLINGTON HGTS	33 S. ARLINGTON HGTS RD.	TSP	91.33	89.32	1.23
BEDFORD PARK	6700 S. 78TH ST.	TSP	87.74	84.50	1.32
BEDFORD PARK	6700 S. 78TH ST.	SO2	23.17	21.12	1.54
BEDFORD PARK	6535 S. CENTRAL AVE.	TSP	117.56	115.21	1.22
BEDFORD PARK	6535 S. CENTRAL AVE.	SO2	19.74	17.93	1.55
BEDFORD PARK	6535 S CENTRAL*	SO2	79.95	77.35	1.26
BELLEVILLE	101 SOUTH ILLINOIS	TSP	95.60	93.52	1.24
BENSENVILLE	MAIN & YORK	TSP	180.63	175.44	1.27
BENSENVILLE	375 MEYER	TSP	75.11	73.34	1.24
BENSENVILLE	375 MEYER	SO2	17.63	15.71	1.60
BLOOMINGTON	WASHINGTON & MADISON	TSP	81.72	76.45	1.44
BLOOMINGTON	WASHINGTON & MADISON	SO2	10.53	9.50	1.67
BLUE ISLAND	12700 SACRAMENTO AVENUE	TSP	128.30	124.40	1.28
BLUE ISLAND	12700 SACRAMENTO AVENUE	SO2	81.67	64.98	1.97
CAHOKIA MOUNDS	BUSINESS ROUTE 40	TSP	133.21	122.75	1.50
CAHOKIA MOUNDS	BUSINESS ROUTE 40*	SO2	56.49	43.41	2.07
CALUMET CITY	755 PULASKI ROAD	TSP	107.13	102.50	1.35
CALUMET CITY	755 PULASKI ROAD	SO2	27.57	18.84	2.39
CALUMET CITY	755 PULASKI RD*	SO2	59.33	56.21	1.94
CHAMPAIGN	2125 SOUTH FIRST	TSP	85.45	83.79	1.22
CHAMPAIGN	2125 SOUTH FIRST	SO2	8.16	7.38	1.56
CHICAGO	5625 NO NATOMA AVE	TSP	70.92	61.79	1.69
CHICAGO	5625 NO NATOMA AVE	SO2	12.75	6.35	3.26
CHICAGO	4015 N ASHLAND AVE	TSP	111.51	109.31	1.23
CHICAGO	4015 N ASHLAND AVE	SO2	36.05	32.63	1.56
CHICAGO	528 S CLARK ST	TSP	92.21	88.02	1.36
CHICAGO	528 S CLARK ST	SO2	60.56	57.61	1.37
CHICAGO	6130 S WOLCOTT AVE	TSP	110.24	108.41	1.20
CHICAGO	6130 S WOLCOTT AVE	SO2	24.67	20.58	1.83
CHICAGO	8010 S KOSTNER AVE	TSP	92.97	87.65	1.41
CHICAGO	8010 S KOSTNER AVE	SO2	29.79	26.34	1.64
CHICAGO	11220 S WALLACE AVE	TSP	93.12	85.25	1.52
CHICAGO	11220 S WALLACE AVE	SO2	33.94	30.54	1.58
CHICAGO	3030 NO MOBILE AVE	TSP	93.24	91.94	1.18
CHICAGO	3030 NO MOBILE AVE	SO2	21.89	18.34	1.31
CHICAGO	1225 N SEDGWICK AVE	TSP	138.70	135.45	1.24

* CONTINUOUS SO2 MONITOR

CITY	ADDRESS	POLLUTANT	CORRECTED ARITH MEAN (UG/M3)	CORRECTED GEO. MEAN (UG/M3)	CORRECTED SGD
CHICAGO	1225 N SEDGWICK AVE	SO2	66.08	64.36	1.26
CHICAGO	4136 S CALIFORNIA AVE	TSP	73.26	59.88	1.39
CHICAGO	4136 S CALIFORNIA AVE	SO2	19.11	13.50	2.30
CHICAGO	8131 S MAY AVE	TSP	87.74	83.26	1.38
CHICAGO	8131 S MAY AVE	SO2	34.44	33.17	1.32
CHICAGO	443 S PLYMOUTH*	SO2	68.86	56.83	1.96
CHICAGO	1947 W POLK*	SO2	43.23	33.41	2.05
CHICAGO	2100 E 87TH ST	TSP	83.86	73.09	1.69
CHICAGO	2100 E 87TH ST	SO2	31.32	28.49	1.54
CHICAGO	801 EAST 133RD ST	TSP	101.27	90.12	1.62
CHICAGO	801 EAST 133RD ST	SO2	33.86	29.57	1.63
CHICAGO	6631 NO BOSWORTH AVE	TSP	73.62	67.52	1.52
CHICAGO	6631 NO BOSWORTH AVE	SO2	35.43	33.28	1.42
CHICAGO	6140 S MELVINA AVE	TSP	97.74	89.83	1.51
CHICAGO	6140 S MELVINA AVE	SO2	40.62	35.83	1.65
CHICAGO	3509 E 114TH ST	TSP	207.31	196.21	1.39
CHICAGO	3500 E 114TH ST	SO2	42.90	39.05	1.54
CHICAGO	5015 S BLACKSTONE AVE	TSP	96.48	90.76	1.42
CHICAGO	5015 S BLACKSTONE AVE	SO2	32.08	30.78	1.33
CHICAGO	2940 W CORTLAND AVE	TSP	105.74	104.53	1.16
CHICAGO	9600 TORRENCE AVE	TSP	132.21	130.19	1.19
CHICAGO	9800 TORRENCE AVE	SO2	33.74	30.54	1.58
CHICAGO	10610 S AVENUE 'H'	TSP	139.35	127.12	1.53
CHICAGO	10610 S AVENUE 'H'	SO2	66.51	63.94	1.32
CHICAGO	3300 E CHELTENHAM PL	TSP	88.46	79.70	1.58
CHICAGO	3300 E CHELTENHAM PL	SO2	37.69	35.58	1.40
CHICAGO	1947 WEST POLK	TSP	109.73	107.40	1.23
CHICAGO	115 NORTH CENTRAL	TSP	106.10	98.33	1.48
CHICAGO	115 NORTH CENTRAL	SO2	18.61	15.33	1.86
CHICAGO	5358 N. ASHLAND:EDGEWATER	TSP	106.17	104.77	1.18
CHICAGO	5358 N. ASHLAND:EDGEWATER	SO2	40.18	38.70	1.32
CHICAGO HEIGHTS	DIXIE HWY AND 10TH ST	TSP	69.68	62.36	1.60
CHICAGO HEIGHTS	DIXIE HWY AND 10TH ST	SO2	27.14	23.36	1.73
CHICAGO HEIGHTS	DIXIE HWY & 10TH ST*	SO2	55.91	44.97	1.94
CICERO	15TH ST & 50TH AVENUE	TSP	106.17	104.77	1.18
CICERO	15TH ST & 50TH AVENUE	SO2	28.24	21.70	2.07
COLLINSVILLE	1134 W MAIN	TSP	67.66	60.76	1.59
COLUMBIA	208 SOUTH RAPP	TSP	60.89	52.64	1.72
CRETE	NORTH & ELIZABETH STS	TSP	101.50	94.44	1.47
CRYSTAL LAKE	FRANKLIN & CAROLINE ST	TSP	51.76	39.09	2.12
DANVILLE	4 NORTH VERMILLION	SO2	7.48	6.39	1.75

* CONTINUOUS SO2 MONITOR

CITY	ADDRESS	POLLUTANT	CORRECTED ARITH. MEAN (UG/M3)	CORRECTED GEO. MEAN (UG/M3)	CORRECTED SGD
DECATUR	22ND & GEDDES	TSP	148.39	142.32	1.33
DECATUR	2700 N 22ND ST*	SO2	55.38	45.25	1.89
DECATUR	125 N. FRANKLIN	TSP	77.29	73.57	1.37
DECATUR	500 E. GARFIELD	TSP	105.04	100.71	1.34
DECATUR	FRANKLIN & WOOD	SO2	10.25	8.61	1.80
DEPUE	1401 MARQUETTE	TSP	86.31	82.95	1.33
DEPUE	EAST STATION*	SO2	55.91	29.17	3.13
DEPUE	WEST STATION*	SO2	49.75	24.14	3.33
DES PLAINES	1755 SOUTH WOLF RD	TSP	80.45	78.34	1.22
DES PLAINES	1755 SOUTH WOLF RD	SO2	11.02	7.12	2.54
EAST MOLINE	915 16TH AVE	TSP	110.13	109.87	1.07
EAST MOLINE	915 16TH AVE	SO2	10.24	7.29	2.28
EAST PEORIA	235 E WASHINGTON	TSP	90.27	77.55	1.73
EAST PEORIA	1107 W. WASHINGTON	SO2	56.91	45.42	1.96
EAST ST LOUIS	7 COLLINSVILLE AVE	TSP	90.01	85.92	1.36
EAST ST LOUIS	650 MISSOURI	SO2	50.34	43.12	1.35
EAST ST. LOUIS	650 MISSOURI*	SO2	70.74	57.61	1.90
EDWARDSVILLE	132 NORTH KANSAS	TSP	80.13	78.00	1.26
EFFINGHAM	1015 S. WILLOW	TSP	45.54	36.03	1.32
EFFINGHAM	1015 S. WILLOW	SO2	8.39	6.75	1.94
ELGIN	1002 N LIBERTY	TSP	77.48	74.99	1.29
ELMHURST	118 SCHILLER	TSP	91.68	89.88	1.22
EVANSTON	1454 ELMWOOD	TSP	52.43	50.04	1.36
FLOSSMOOR	999 KEDZIE AVENUE	TSP	90.27	87.40	1.29
FLOSSMOOR	999 KEDZIE AVENUE	SO2	23.37	18.45	1.97
FRANKLIN PARK	3400 NORTH ROSE	TSP	78.73	75.37	1.34
GALENA	COMMERCE STREET	TSP	90.38	85.94	1.37
GALENA	COMMERCE STREET	SO2	7.35	4.75	2.54
GALESBURG	LIBRARY MAIN ST	TSP	54.67	37.47	2.39
GRANITE CITY	2000 EDISON AVE	TSP	132.82	129.29	1.26
GRANITE CITY	2000 EDISON AVE	SO2	44.51	42.60	1.35
GRANITE CITY	23RD AND MADISON	TSP	159.42	154.82	1.27
GRANITE CITY	2301 ADAMS*	SO2	69.83	58.38	1.82
GRANITE CITY	3201 E. 23RD	TSP	101.69	96.05	1.40
GRANITE CITY	2001 E. 20TH	TSP	264.58	251.51	1.37
GRANITE CITY	15TH AND MADISON	TSP	225.80	223.54	1.15
GRANITE CITY	ROOSEVELT & ROCK ROAD	TSP	189.55	186.95	1.09
GRANITE CITY	LINCOLN & NAMEOKI ST.	TSP	153.16	141.64	1.49
GRANITE CITY	NORFOLK AND WESTERN	TSP	221.33	214.59	1.28
HARVEY	157TH ST & LEXINGTON	TSP	126.81	125.39	1.16
HARVEY	157TH ST & LEXINGTON	SO2	19.90	15.01	2.17

* CONTINUOUS SO2 MONITOR

CITY	ADDRESS	POLLUTANT	CORRECTED ARITH. MEAN (UG/M3)	CORRECTED GEO. MEAN (UG/M3)	CORRECTED SGD
HENNEPIN	5TH & HIGH	TSP	83.11	79.59	1.34
HENRY	HENRY HIGH SCHOOL	SO2	10.67	6.17	2.85
HILLSIDE	WOLF & HARRISON	TSP	96.41	94.56	1.21
HILLSIDE	WOLF & HARRISON	SO2	9.41	7.23	2.07
ISLAND LAKE	ISLAND LAKE GRADE SCHOOL	TSP	57.99	53.49	1.69
JOLIET	E VAN BUREN ST	TSP	67.33	47.46	2.33
JOLIET	MIDLAND & CAMPBELL ST	TSP	86.95	78.51	1.57
JOLIET	COPPERFIELD & BRIGGS STS	TSP	76.93	71.93	1.44
JOLIET	JOLIET & BENTON STS	TSP	108.63	104.36	1.33
JOLIET	JOLIET & BENTON*	SO2	18.89	10.70	2.90
JOLIET	JR HALL 1210 NICHOLTST	TSP	73.01	61.57	1.79
JOLIET	501 ELLA AVE	TSP	77.17	64.02	1.84
LAKE BLUFF	121 E SHERIDAN PLACE	TSP	61.40	60.00	1.24
LASALLE	541 CHARTRES	SO2	10.25	8.61	1.80
LASALLE	541 CHARTRES*	SO2	29.98	23.43	2.02
LOCKPORT	5TH & MADISON	TSP	67.78	56.62	1.82
MARION	2209 W MAIN ST.	TSP	58.65	65.72	1.34
MARION	2209 W MAIN ST.	SO2	24.09	22.35	1.47
MARION	2209 W MAIN ST*	SO2	59.27	45.64	2.06
MIDLOTHIAN	15205 CRAWFORD	TSP	66.78	61.61	1.49
MILAN	125 W. 2ND AVE.	TSP	106.98	104.33	1.22
MOKENA	10940 FRONT ST	TSP	100.84	94.95	1.41
MOLINE	CITY HALL 619 16TH STREET	TSP	67.76	53.96	1.96
MOLINE	3600 23RD AVE.	TSP	78.69	77.73	1.17
MONEE	432 E MAIN ST	TSP	98.59	96.05	1.25
MORTON GROVE	9111 WAUKEGAN RD.	TSP	90.46	88.74	1.22
MORTON GROVE	9111 WAUKEGAN RD.	SO2	18.96	16.85	1.63
MT. VERNON	501 NORTH 18TH ST.	TSP	59.86	55.04	1.51
MCCOOK	50TH ST & 1ST AVE	TSP	140.58	137.04	1.25
MCCOOK	50TH ST & GLENCOE*	SO2	41.53	33.05	1.97
MCCOOK	RT 66 & LAWNDALE	TSP	167.67	169.31	1.07
NAPERVILLE	175 JACKSON	TSP	90.14	88.90	1.18
NILES	8955 GREENWOOD AVENUE	TSP	73.24	67.83	1.48
NORMAL	401 W VIRGINIA*	SO2	53.67	48.47	1.57
N CHICAGO	1850 LEWIS AVE	TSP	47.57	37.33	2.01
ORLAND PARK	133RD ST & LAGRANGE	TSP	66.34	51.53	2.04
OTTAWA	211 E. MAIN	TSP	57.68	37.49	2.53
OTTAWA	211 E. MAIN	SO2	18.45	16.93	1.51
PALATINE	1000 QUENTIN ROAD	TSP	64.64	58.38	1.57
PARK FOREST	100 PARK AVE	TSP	44.12	37.81	1.74
PARK FOREST	100 PARK AVE	SO2	7.52	5.14	2.39

* CONTINUOUS SO2 MONITOR

CITY	ADDRESS	POLLUTANT	CORRECTED ARITH. MEAN (UG/M3)	CORRECTED GEO. MEAN (UG/M3)	CORRECTED SGD
PEKIN	531 COURT	TSP	75.39	62.44	1.85
PEKIN	272 DERBY*	SO2	48.34	35.64	2.18
PEORIA	HURLBURT & MACARTHUR*	SO2	45.43	27.22	2.75
PEORIA	610 NE. JEFFERSON	TSP	157.70	152.21	1.30
PEORIA	2711 SW. JEFFERSON	TSP	130.14	126.26	1.28
PEORIA	2711 SW. JEFFERSON	SO2	30.84	29.22	1.39
PEORIA	1604 DETWEILLER	TSP	94.07	90.15	1.34
PEORIA	1604 DETWEILLER	SO2	14.36	10.58	2.19
PEORIA	BRADLEY UNIVERSITY	TSP	85.99	81.02	1.41
PEORIA	419 FULTON	SO2	48.20	47.36	1.21
PETERSBURG	MONROE & JACKSON	TSP	72.43	69.67	1.56
PLAINFIELD	1305 EASTERN	TSP	76.11	56.36	2.17
PLANO	PLANO CITY HALL	TSP	61.44	46.98	2.08
QUINCY	FIRE STA 9TH & VERMONT	TSP	64.79	55.92	1.72
QUINCY	9TH & VERMONT*	SO2	48.39	39.64	1.88
QUINCY	18TH & ELM	SO2	15.02	13.74	1.52
RIVER FOREST	LATHROP AND OAK	TSP	84.13	82.28	1.24
ROCKDALE	WELL #2	TSP	108.53	98.82	1.54
ROCKFORD	126 SOUTH FIRST STREET	TSP	75.03	69.41	1.48
ROCKFORD	2525 OHIO	TSP	50.85	42.31	1.83
ROCKFORD	1528 18TH AVE PUMP HOUSE	SO2	20.60	19.72	1.34
ROCKFORD	1528 18TH AVE*	SO2	53.50	47.40	1.64
ROCK ISLAND	1528 3RD AVENUE	TSP	84.97	76.04	1.60
ROCK ISLAND	1504 THIRD AVE*	SO2	74.19	63.06	1.77
ROCK ISLAND	1400 25TH AVE.	TSP	85.26	84.42	1.15
ROMEOVILLE	NAPERVILLE RD	TSP	127.60	123.91	1.27
ROMEOVILLE	NAPERVILLE RD	SO2	9.70	6.10	2.62
SKOKIE	9500 LAWLER ST	SO2	12.20	9.47	2.04
SKOKIE	9800 LAWLER*	SO2	55.91	44.97	1.94
SKOKIE	4401 DEMPSTER	TSP	84.42	81.59	1.30
SKOKIE	7701 LINCOLN AVE.	TSP	97.13	95.44	1.20
SPRINGFIELD	224 WEST ADAMS	TSP	102.12	96.61	1.40
SPRINGFIELD	224 WEST ADAMS	SO2	20.50	17.23	1.80
SPRINGFIELD	224 W ADAMS*	SO2	25.27	17.56	2.35
SPRINGFIELD	712 S DIRKSEN*	SO2	38.18	15.23	3.88
STERLING	FIRE STA 110 W 5TH ST	TSP	88.80	77.19	1.70
SUMMIT	60TH & 74TH AVENUE	TSP	120.36	117.11	1.26
SUMMIT	60TH & 74TH AVENUE	SO2	29.20	26.34	1.57
WAUKEGAN	CITY HALL 106 UTICA ST	TSP	84.23	82.65	1.21
WAUKEGAN	3010 GRAND AVENUE	SO2	22.87	21.42	1.44
WAUKEGAN	GULF & JACKSON*	SO2	34.43	28.42	1.86

* CONTINUOUS SO2 MONITOR

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CITY	ADDRESS	POLLUTANT	CORRECTED ARITH MEAN (UG/M3)	CORRECTED GEO. MEAN (UG/M3)	CORRECTED SGD
WAUKEGAN	SHERIDAN RD & GREENWOOD*	SO2	5.78	2.75	3.39
WEST CHICAGO	DUPAGE COUNTY AIRPORT	TSP	73.25	71.45	1.25
WEST CHICAGO	123 W MCCONNELL	TSP	92.38	88.66	1.33
WHEATON	COURTHOUSE 201 REBER ST	TSP	69.51	63.34	1.54
WILMETTE	NW CORNER 9TH & CENTRAL	TSP	67.66	64.29	1.38
WILMETTE	NW CORNER 9TH & CENTRAL	SO2	9.85	5.46	2.51
WINNETKA	112 WILLOW RD	TSP	59.94	58.10	1.28
WOOD RIVER	WATER TRT PLT 54 WALCOTT	TSP	91.26	86.64	1.37
WOOD RIVER	WATER TRT PLT 54 WALCOTT	SO2	47.53	43.25	1.55
WOOD RIVER	54 W WALCOTT*	SO2	84.81	55.36	2.52

* CONTINUOUS SO2 MONITOR

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(2) Curran, Thomas C., and Frank, Neil H., "Assessing the Validity of the Lognormal Model When Predicting Maximum Air Pollution Concentrations", paper No. 75-51.3, 1975 Annual Meeting of the Air Pollution Control Association, Boston, Mass.

(3) Monitoring and Air Quality Trends Report, 1973, USEPA Office of Air and Waste Management, Office of Air Quality Planning and Standards Research Triangle Park, North Carolina, EPA 450/1-74-007 October 1974.

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